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SEPTEMBER 1985

VOLUME 3
ISSUE 9

A+

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- USING UNIX
- MAC GRAPHICS TABLET
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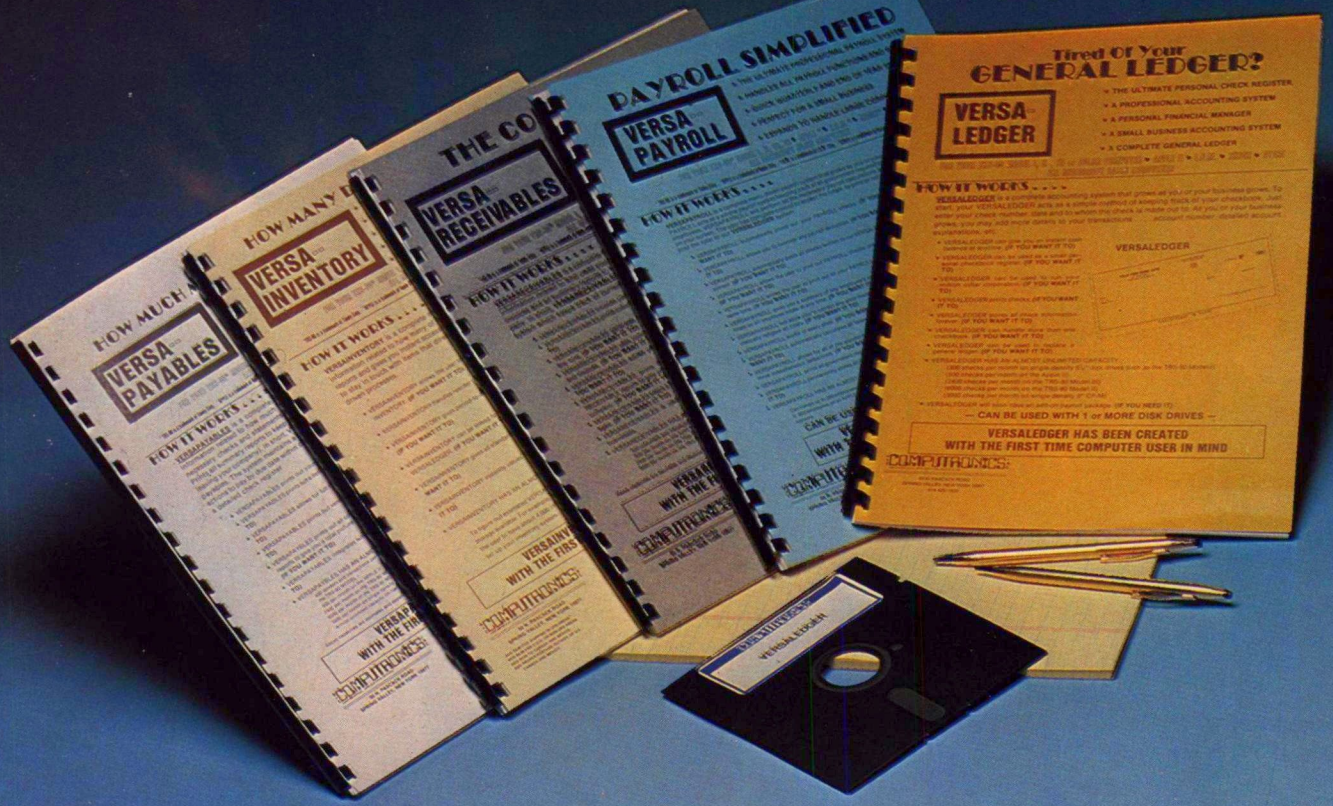

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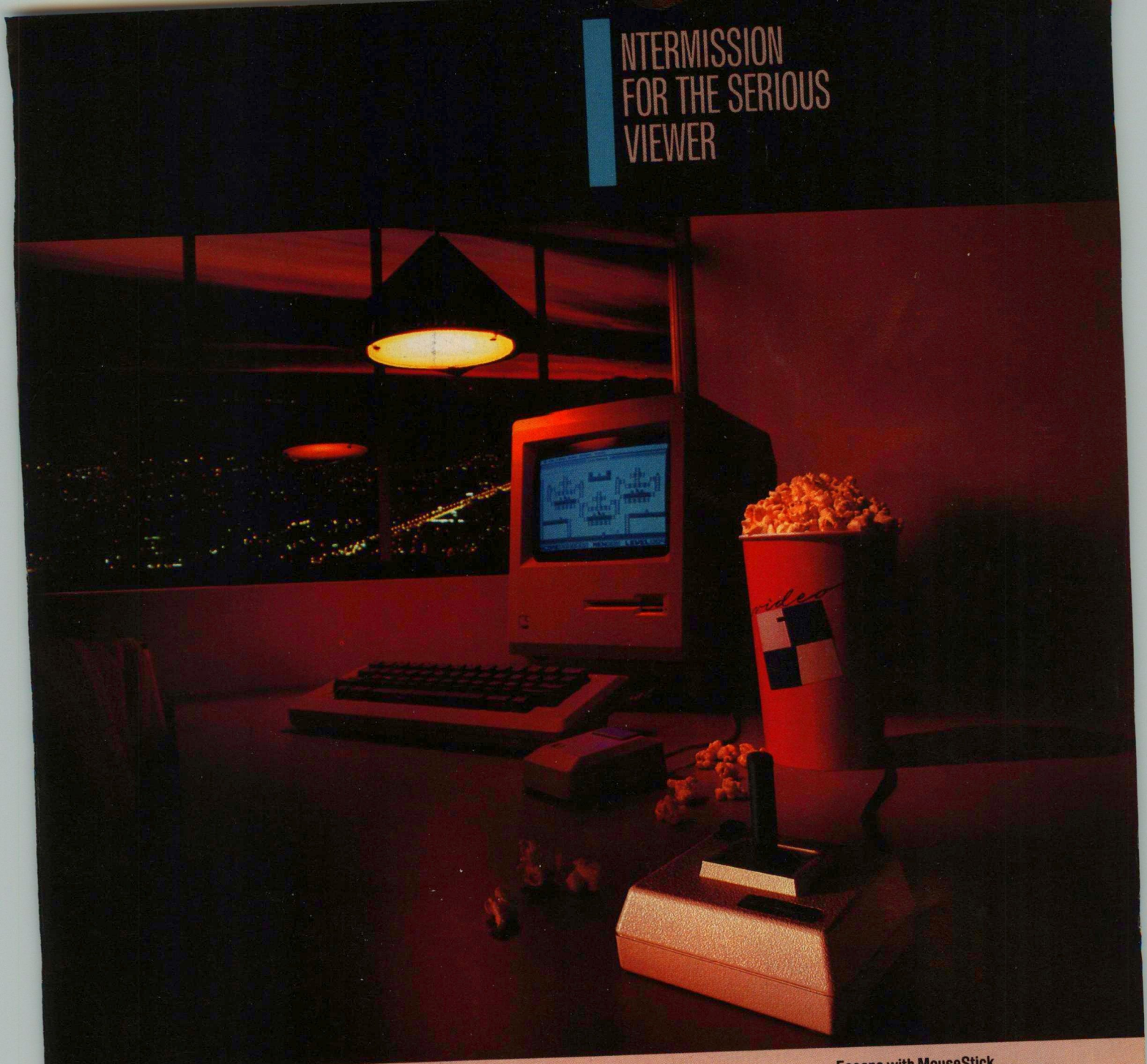

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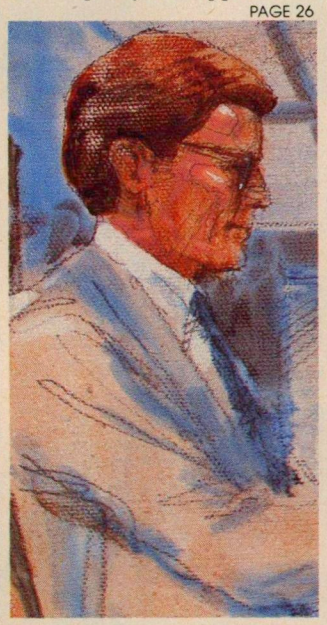

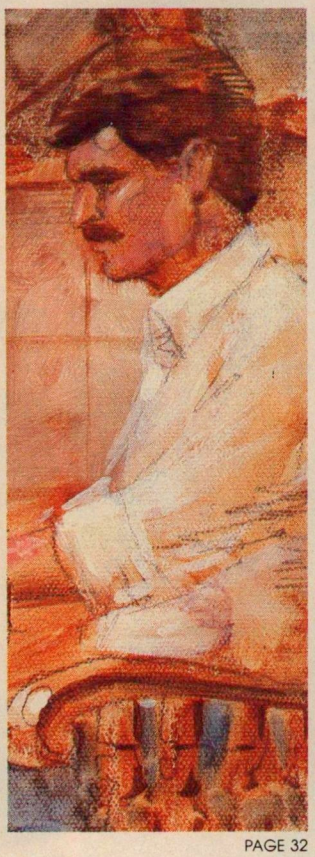

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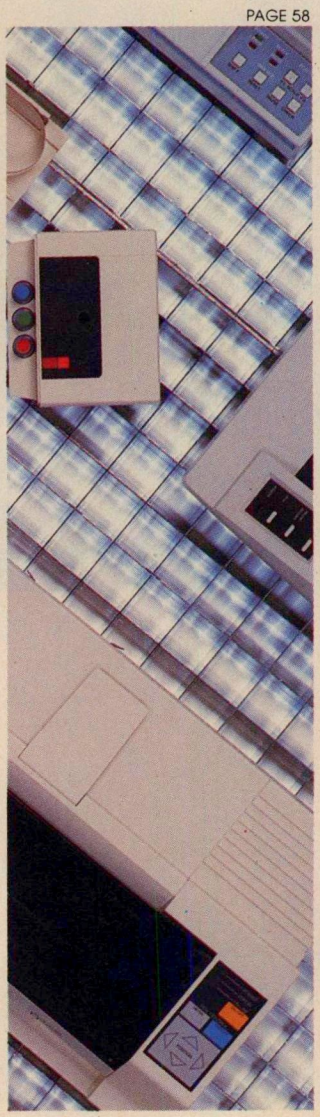

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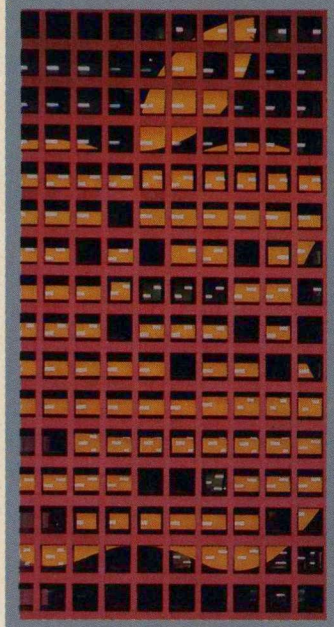

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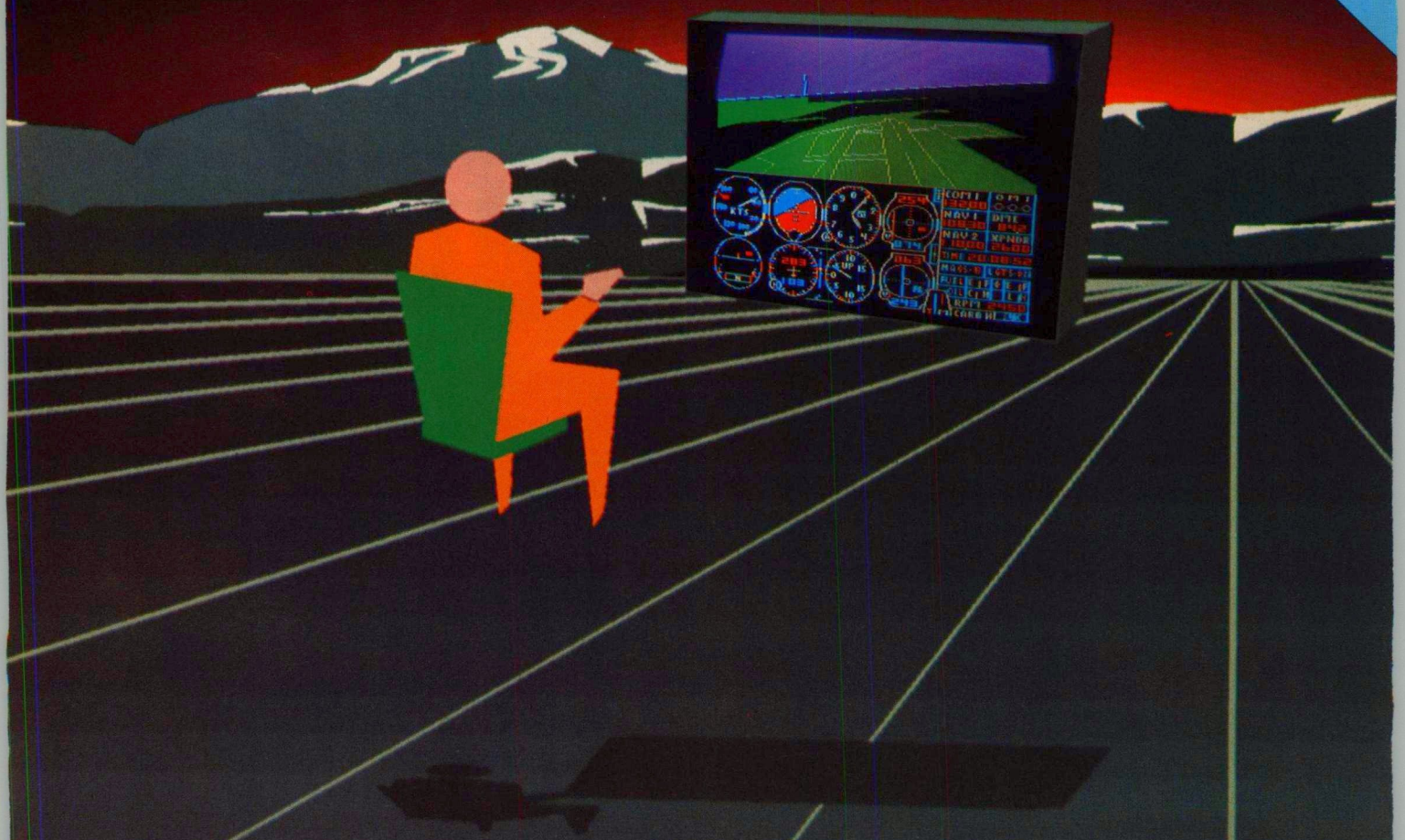

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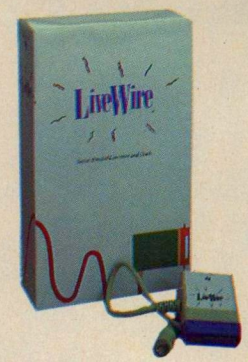

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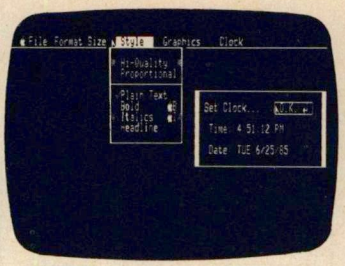
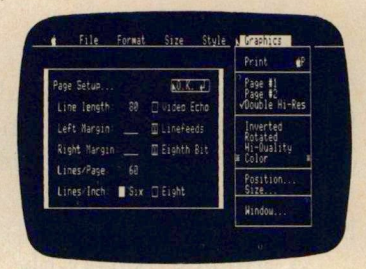


AlphaBits II Menu



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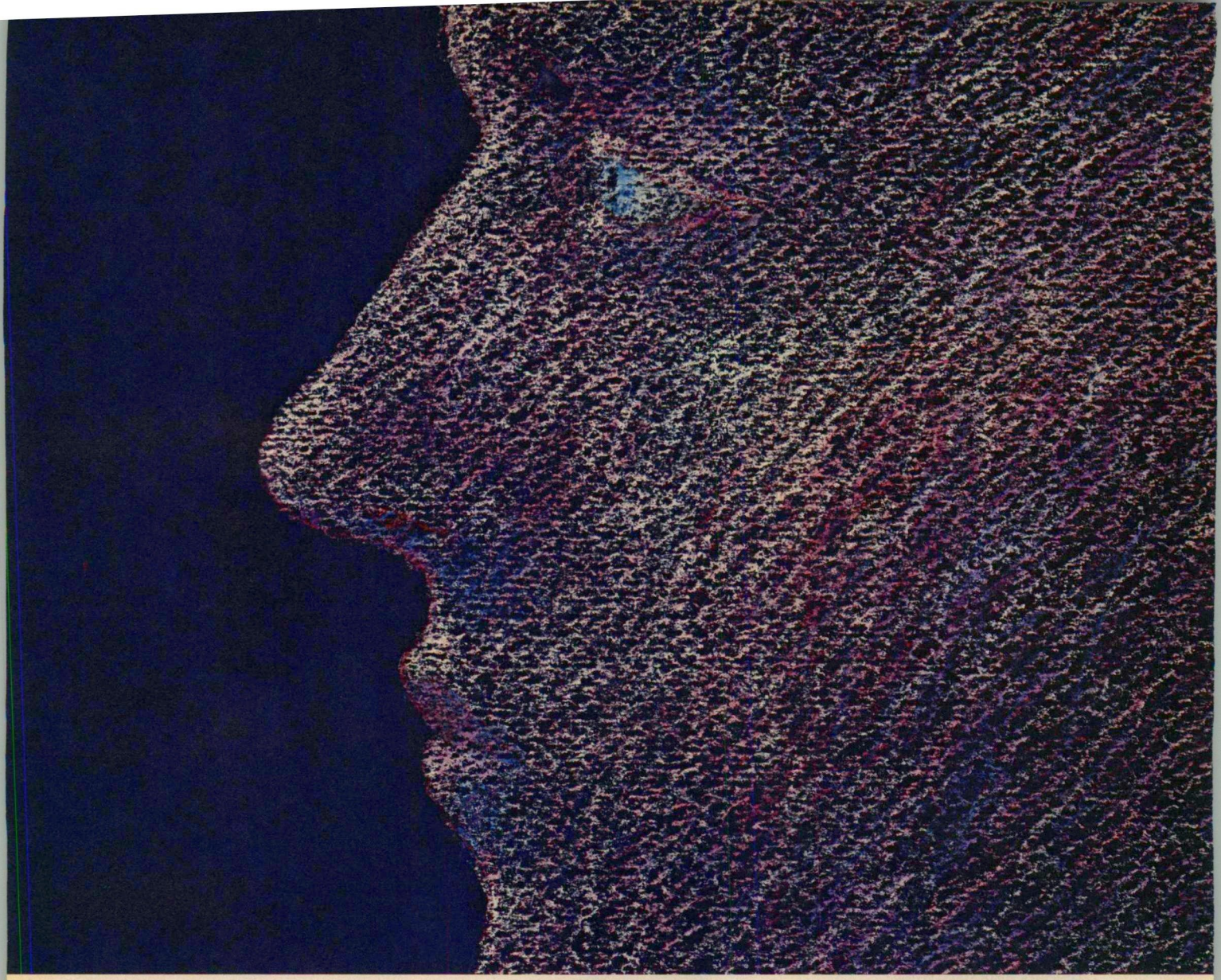

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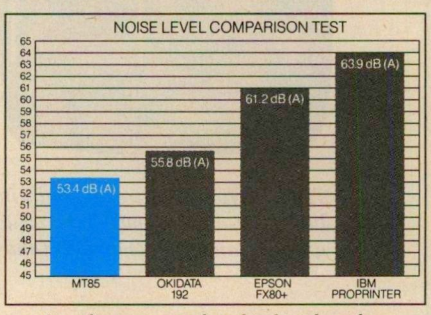

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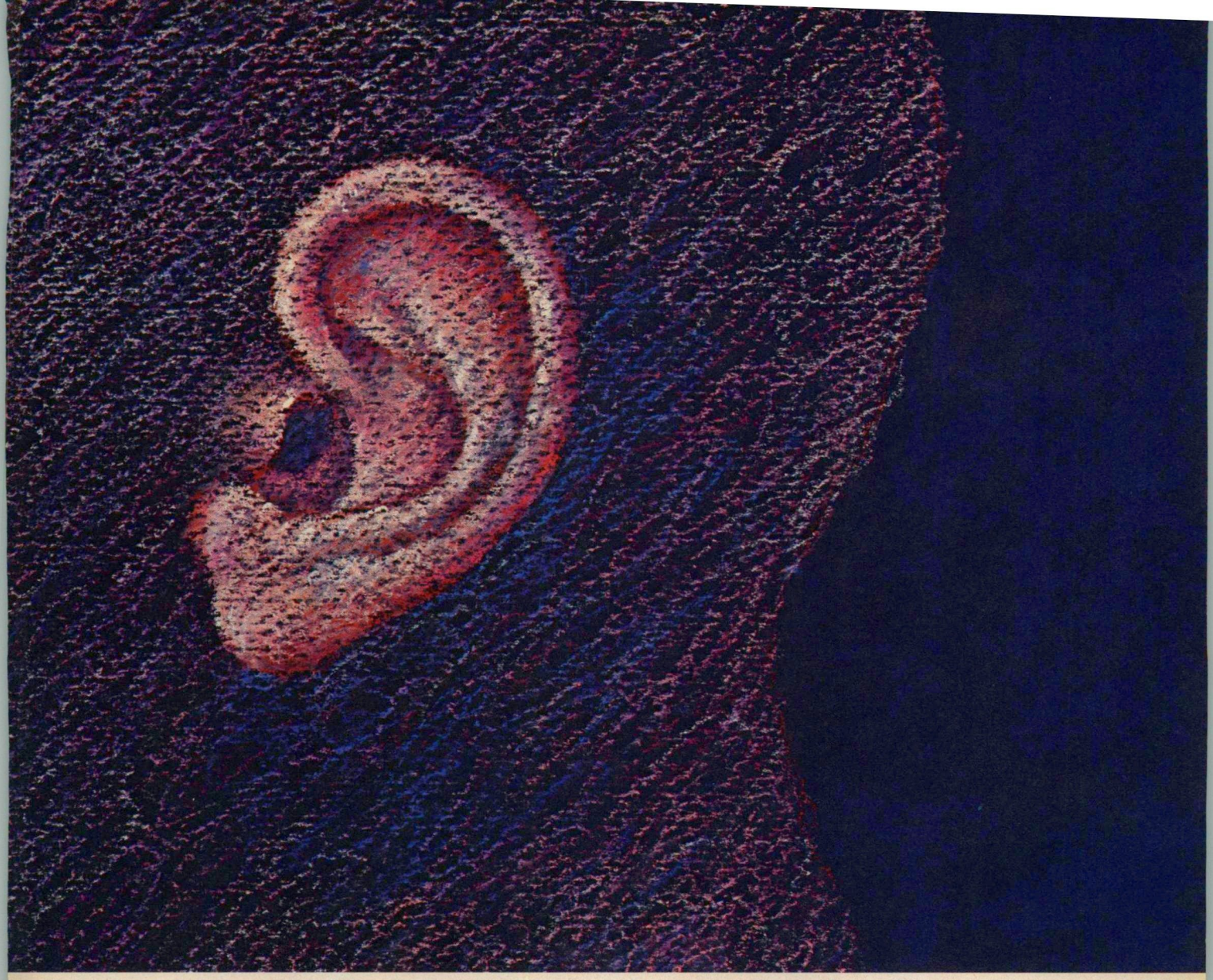

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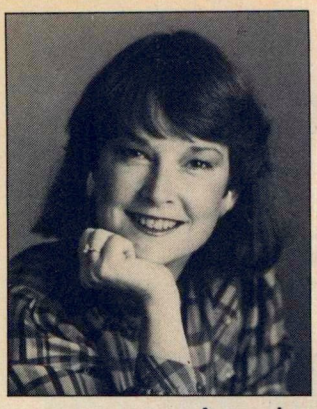

Apple Computer reorganizes into a streamlined, unified company.

APPLE GROWS UP

As a general rule, we don't discuss the inner workings of Apple Computer, Inc. Sometimes, however, an event warrants a comment.

You may have read in *The Wall Street Journal* or your local newspaper about Apple's recent reorganization. To summarize: Steve Jobs is no longer involved in the day-to-day operations at Apple; as Chairman of the Board, he will be concentrating on more "global" issues. John Sculley, CEO, has reorganized Apple from a company constructed along product-line divisions to one based on marketing and manufacturing divisions.

First, some history. Nearly everyone knows the story of the two young Californians who started Apple Computer in a garage. Steve Wozniak created the product, and Steve Jobs created the company. What a lot of people don't know is that Steve Jobs did not run the company in those early days. He recruited some bigwigs to run the fledgling company—among them was Mike Markula, who had already made millions running Intel, one of the biggest chip companies in Silicon Valley. Creating a company wasn't enough for the restless and ambitious Jobs, however. He wanted to create his own computer, one that would change the world by bringing personal computing to the rest of us. Accordingly, Jobs focused his energies on developing the Macintosh, typically agonizing over every detail.

In the meantime, Apple was growing by leaps and bounds, thanks to the ever-popular Apple II computer. Jobs realized that the phenomenally successful young company needed consummate leadership to bring his "insanely great" new computer to market and help guide Apple into the future. He went looking for the best. His choice, John Sculley, head of Pepsi Cola, had battled with Coke and won. This was the man to bring Apple computers to the masses, to develop Apple Computer into a billion-dollar company, and ultimately to make it the largest corporation in America.

John Sculley came to Apple with high hopes. Little could he know that IBM would come thundering into the market and that the market itself would take a nosedive. In the beginning, he went along with Jobs' ideas, summed up in what is now known as *psychographics*: create a product and then create a market. As time went on, though, it became apparent that the market-research firms had grossly overestimated the size of the potential personal-computer market. It was also obvious that IBM, Digital Equipment Corporation, Wang, and others had the *Fortune* 500 market sewed up and that the dream of computers for everyone was not coming true.

After a disastrous annual meeting—during which no mention of the Apple II was heard—the bitter feud between the Apple II and the Macintosh divisions became public. Then followed a stream of resignations from top and middle managers and engineers (including cofounder Steve Wozniak) and a bleak second and third quarter. Sculley and the rest of the board realized something must be done, and quickly.

Hence, they made the decision to reorganize Apple into a streamlined, unified company; promote some of the seasoned managers; and bring in new, professional marketers.

What does it all mean? It means that Apple is growing up and getting in shape to face a tough future. It also means that Apple's management realizes that it wasn't smart to push the winning Apple II division out of the limelight.

I believe Apple is taking correct action and that the company you have put your faith in will continue to be a star for a long, long time. ✚

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MAGGIE CANON/**EDITOR**

Why Every Serious User of an Apple IIe is Buying RAMWORKS™

APPLEWORKS MEMORY Even though Ramworks enhances and expands a VAST ARRAY of other programs, Appleworks is our claim to fame. A 64K Ramworks will ADD 46K to your available desktop memory, a 128K Ramworks will ADD 91K, a 256K Ramworks will ADD 182K, a 512K Ramworks will ADD 364K and a 1 meg Ramworks will give you nearly an 800K desktop. And it's all done automatically! When you plug in more memory chips into your Ramworks card, Appleworks will find them—automatically. Ramworks also increases the maximum number of records from 1350 to 4300. And should you ever create a file larger than your disk capacity, Ramworks will automatically prompt you to insert more disks, so that any size file can be saved on regular floppies or a hard disk.

APPLEWORKS SPEED AND POWER Ramworks does more than just increase the desktop memory (as if that weren't enough). With Ramworks, Appleworks will be able to run up to 20 times faster. If you buy a 256K or larger Ramworks card, Appleworks will automatically load itself in Ramworks. This greatly increases the speed at which Appleworks operates by eliminating all that nasty, time consuming disk access on Drive 1. These are but a few reasons why we say that Ramworks is Appleworks' best friend.

EXPANDABILITY Ramworks was designed with the future in mind. As your needs increase, so can Ramworks. Clear instructions show you how to plug in more memory.

CO-PROCESSOR POWER A memory expansion connector on Ramworks will allow future co-processor cards to access the Ramworks memory, so you'll be able to take advantage of the new 16 and 32 bit microprocessors. This connector will also allow Ramworks to be expanded another 2 megabytes, so as memory technology improves, so will Ramworks.

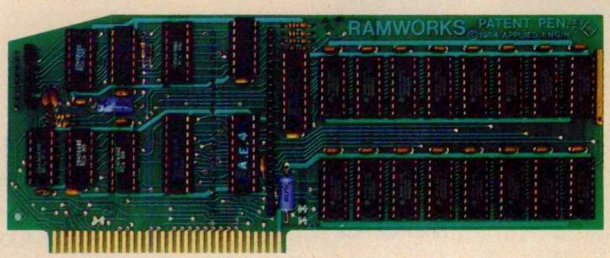
SPEED Today, as programs become more and more sophisticated, they inevitably become larger. And many of today's best selling programs (like Appleworks) won't fit in a 128K Apple, so many of these new larger programs continually go back to disk in search of more data. With Ramworks, you can have enough memory so that the entire program will be loaded into Ramworks' memory. This greatly increases the speed of software because your disk runs at 300 RPM, but Ramworks operates at the speed of light!

COLOR The same slot that's used for memory expansion is also the slot that's used for RGB color display, so all those lesser memory cards of yesterday make you decide in advance if you want RGB color. Ramworks lets you decide later to add RGB color. For only $129, an RGB option can be added to Ramworks to give you double high resolution color graphics and 80 column text. All with a razor sharp, vivid brilliance that's unsurpassed in the industry. The RGB option does not waste another valuable slot, but rather plugs into the back of Ramworks and attaches to any Apple compatible monitor. Remember, you can order the RGB option with your Ramworks or add it on at a later date.

COMPATIBILITY, OF THE SOFTWARE KIND Programs like Appleworks, Magic Office System, Flashcalc, The Spread Sheet, Diverse-A-Dos, Supercalc, Magicalc and many others automatically recognize all or most of Ramworks' memory (512K is average). The simple fact is that Ramworks is compatible with more off-the-shelf software than any other RAM card. Ramworks is 100% compatible with ALL software written for the Apple 80 column and extended 80 column card. Additionally, Ramworks can emulate other RAM cards so software written for other cards will run without modification. Software written for Ramworks will not work on other cards. We can emulate others, but others can't emulate us.

COMPATIBILITY, OF THE HARDWARE KIND Unlike others, Ramworks is fully compatible with hardware add on's from other companies, like the Sider and Profile hard disks. And Ramworks was designed in accordance with the official expansion rules defined by Apple so you don't have to worry about compatibility problems. As you continue to expand and make your Apple more powerful with other expansion products from Applied Engineering, you'll appreciate how each product has extra features designed to work with Ramworks and other products to give you a total performance package that is more powerful than the sum of its parts.

IT'S POPULAR Popularity translates into great software support because software companies can't support all RAM cards, they can only support the ones their customers are likely to own. And software companies appreciate the fact that when they write software for Ramworks in the IIe, they're also writing software for our memory expansion card for the IIc, Z-RAM. And our customer list reads like the Who's Who of Apple computing with just about every software company in the land buying one, including Apple Computer and Steve Wozniak



IT'S FROM APPLIED ENGINEERING Unlike most of the competition, we only make accessories for Apple, so we'll never spend your money on IBM product research. Applied Engineering's years of experience and wide product line really pays off, and because of our high sales levels we buy most of our I.C. chips factory direct. So don't let our low prices fool you, they're caused by high volume production. That's why we can offer the most memory for the least money. Guaranteed!

IT'S GOT IT ALL

- ☑ Sharp 80 Column Text
- ☑ Double high resolution graphics (with or without RGB option)
- ☑ User Expandable to 1 Megabyte
- ☑ Can Use 64K or 256K RAMS in any combination
- ☑ Adds Memory to Appleworks
- ☑ Accelerates Appleworks
- ☑ 100% Compatibility with All IIe software
- ☑ RAM Disk software available, compatible with Applesoft, PRO-DOS, DOS 3.3 and PASCAL ($29)
- ☑ RAM Disk available for CP/M ($29). (This program is included with our CP/M card)
- ☑ Visicalc preboot available ($29)
- ☑ RGB option
- ☑ Takes only one slot
- ☑ 5 year no hassle warranty

OUR CUSTOMERS LIKE RAMWORKS

"I've purchased many peripherals for my Apples over the years, but none have proved so useful as RamWorks." —Steve Wozniak

"RamWorks is incredibly great. Ten Minutes after I installed it, I gave my IBM PC, 10 Megabyte Hard Disk, FRAMEWORK and SYMPHONY to Goodwill." — S. High

"Your RamWorks card is simply a lifesaver to say the least. It worked like a breeze. I'm a sure believer in your product after thoroughly running it through the 'mill' since I've had it. I'm now considering another of your excellent products. Good luck in the future!" — M. Deming

"RamWorks is the 2nd product I've purchased from Applied Engineering. The quality and dependability of Applied Engineering products has once again been recognized, keep up the good work." — R. Lener

Ramworks™ with 64K	**$179**
Ramworks™ with 128K	**$249**
Ramworks™ with 256K	**$299**
Ramworks™ with 512K	**$399**
Ramworks™ with 1 MEG	**$649**
RGB Option (can be added later)	**$129**

Call (214) 241-6060
9 a.m. to 11 p.m. 7 days a week or send check or money order to:
Applied Engineering, P. O. Box 798, Carrollton, Texas 75006

MasterCard VISA Visa and
C.O.D. welcome. No extra charge for credit cards. Texas Residents add 5⅛% sales tax. Add $10.00 of outside U.S.A.

APPLIED ENGINEERING
"We Set the Standard"

LETTERS TO THE EDITOR

MORE ON AMPLIFYING APPLEWORKS

Dear *A+*,

The July issue of *A+* presented an article by Michael Callery entitled "Amplifying AppleWorks," which offered a guide to AppleWorks add-on products. The article, however, presented only one company as providing a bigger desktop for AppleWorks. Legend Industries also has a product that expands the 55K limitation of AppleWorks to 735K of desktop.

Legend's package consists of a 1-megabyte expansion board, the E Card, in combination with our software, "Executive DeskTop System."

Additional features of the E Card package are:

- 64K to 1 megabyte of RAM expansion on one board.
- Monochrome video connection: 16 levels of gray, which produce a near-photographic-quality image.
- RGB video connection.
- Double high-resolution.
- Extended 80 columns.
- Disk emulation for DOS 3.3, CP/M, and ProDOS.

Norman J. Dybowski
Vice President, Marketing and Sales
Legend Industries
Pontiac, MI

SPEECH SYNTHESIS

Dear *A+*,

I read with interest Steve Rosenthal's article on speech synthesis in the May issue of *A+*, and I commend him for summarizing handily a complex field. I would like to add one piece of hardware to the list: the pricey (around $4000), but excellent, DECtalk from Digital Equipment Corporation.

I'm sure that space limitations prevented any mention of the companies producing practical applications for the existing hardware. Several companies produce and support talking applications software for blind, visually impaired, and other microcomputer users who are disabled. Our newsletter lists many resources for new computer users who are interested in software accessible through voice and braille.

Ms. Jesse Kaysen, Vice President
Raised Dot Computing
408 South Baldwin
Madison, WI 53703

PRINTING PROBLEMS

Dear *A+*,

Michael Callery, in his "Rescue Squad" column in the June 1985 issue, makes reference to printing problems when using the Orange Micro Grappler Card with AppleWorks. I too, had been experiencing extra spaces and word wrapping with my Apple IIe, Grappler interface card, and Panasonic 1091 system. I spent a few minutes with a very helpful Lynda Higgs at the Orange Micro booth at COMDEX in Atlanta a couple of weeks ago, and I'd like to pass along Lynda's tips for the benefit of any other readers who might be similarly affected:

If you're using AppleWorks 1.1, see your Apple dealer for a free reconfiguration utility disk, which should solve the problem.

If you're using AppleWorks 1.2, bring up the printer interface menu on AppleWorks and change the setup from CTRL 8ON to CTRL ON.

Lynda's phone number is (714) 779-2772, and I'd like to tip my hat to her because the fix for AppleWorks 1.2 works like a charm!

Ping Sun Chun
Morristown, NJ

MYSTERIOUS CONTENTS

Dear Readers,

You may have noticed in the "Table of Contents" of the August 1985 issue of *A+* a series of mysterious empty spaces beneath the page numbers in the Macintosh Coverage section, where you're used to seeing the article headlines and bylines.

The reason for this error involves long, technical explanations about the four-color filmmaking process, as well as a true-life, lost-in-the-mail story. On this occasion, however, we can honestly say, "It happened at the printer's." By the time news of the error reached us, the presses had rolled too far for us to stop them.

Although we are confident that you found your way through the section, using the minimal amount of clues provided on the contents page, we sincerely apologize for the inconvenience.

Alas, the "Table of Contents" also contained a typo we were assured would be corrected before the presses rolled. The description for "A Close Look at Recent IIe Enhancements" (page 45) contained a reference to the (nonexistent) "5602 microprocessor." We were referring, of course, to our old friend, the 6502 microprocessor.

Editors

CORRECTIONS

Red Ryder,

Our July 1985 article "Penny-Wise Programs" incorrectly stated that Red Ryder is public-domain software. Red Ryder may be copied for evaluation, and anyone who uses it is morally and legally obligated to purchase it. The evaluation license is for 45 days, and Red Ryder's author, Mr. Watson, requests you only register the software if it meets your needs.

Titan's Accelerator Card

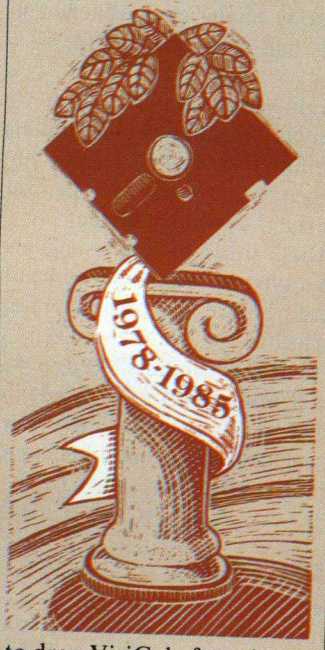
Our July 1985 article "Amplifying AppleWorks" incorrectly stated that Titan's Accelerator Card with its own RAM would not speed up recalculations nor provide extra desktop space in AppleWorks. Titan's Accelerator will speed up recalculations and will provide extra desktop space.

NEWS+

BY FREDERIC E. DAVIS

VISICALC, 1978–1985

VisiCalc, the pioneer Apple II spreadsheet program that helped the microcomputer industry get off the ground, died a quiet death this summer at the hands of Lotus Development Corporation. Lotus bought Software Arts, the company that created VisiCalc, and decided



to drop VisiCalc from its product line because it felt the IBM PC version of VisiCalc competes with 1-2-3.

Software Arts had recently won a long and bitter court battle to regain control of VisiCalc from VisiCorp. The court battle weakened consumer confidence in the VisiCalc product and took its toll on both companies; not only was Software Arts acquired by Lotus, but also the weakened VisiCorp was acquired by a small start-up company named Paladin, producer of the new Crunch spreadsheet for the Mac. Appropriately enough, the last copy of VisiCalc that was shipped was an Apple II version. Adieu fair VisiCalc, I knew thee well.

THOU SHALT NOT DUPE

Central Point Software's Copy II program now contains a letter imploring users to be conscientious about copying software, in an effort to help users distinguish between legitimate and illegal uses of copy programs. The letter states, "Under the copyright law, you have a right to make copies to use in the event your original disk no longer functions. It is important to note that this is the only right to copy afforded under the law."

Also enclosed in the package is a pamphlet from ADAPSO entitled "Thou Shalt Not Dupe," which further drives home the point that certain uses of copy programs are illegal. The pamphlet begins, "People who would never walk into a store and shoplift a software product think nothing of making several copies of that same software." The pamphlet then goes on to state, " . . . reproducing computer software without authorization violates the U.S. Copyright Law. It is a Federal offense . . . civil damages for unauthorized software copying can be as much as $50,000 or more and criminal penalties include fines and imprisonment."

MODEM ON A CHIP

As microelectronics technology advances and circuits get smaller and smaller, companies are able to shrink both the size and cost of important computer components. An innovative product that drives home this point is the Mosart modem-on-a-chip from a new start-up company called XECOM, Inc. The Mosart is 2¼ inches long by 1 inch wide by ½ inch thick. It features an intelligent 1200-bps modem that can switch quickly between voice and data communications on the same line.

The Mosart comes in two models. The XE1201 is the basic modem unit. The XE1203 includes a voice-synthesis option that allows the modem to answer tones from a touch-tone phone and respond with synthetic speech. The Mosart is registered with the FCC and can be connected directly to a telephone jack. Currently, the Mosart is available only to developers, but it should start showing up in products soon. For further information contact: XECOM, Inc., 374 Turquoise Street, Milpitas, CA 95053; (408) 943-0313.

APPLE HELPS SCHOOLS

Apple's Education Affairs program has recently awarded 15 more grants to colleges and elementary schools to encourage the use of computers in classroom curricula. Here's a sample of the myriad applications to which the latest crop of Apples will be put: studying the impact of humans on the Lake Champlain basin; using computer graphics to improve science comprehension; improving language competence in deaf students; and creating a phonetic, graphic alphabet for Native American Indian languages. For more information about the Education Affairs program, write to Education Affairs, Apple Computer, Inc., 20525 Mariani Avenue, Cupertino, CA 95014.

THANKS FOR THE MEMORY

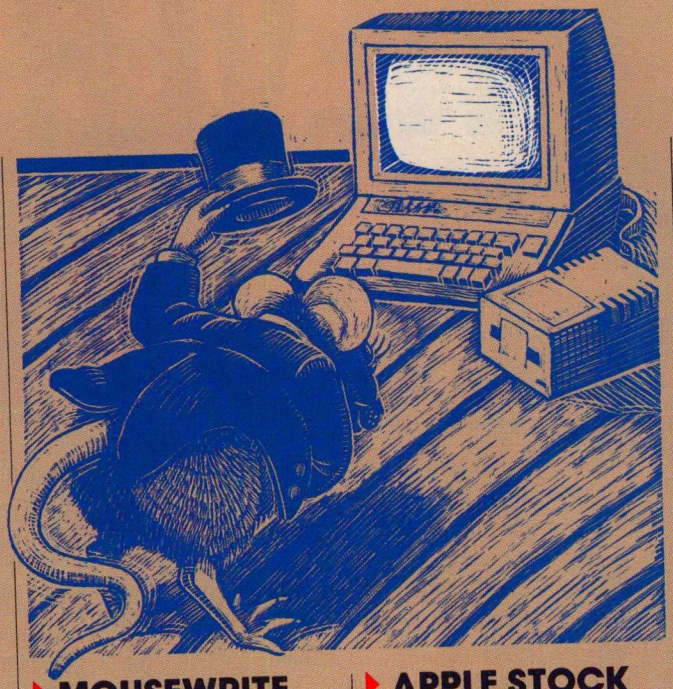
The price of 256K RAM chips has been dropping drastically. Already the race is on to create larger chips, and several semiconductor companies have announced plans to offer 1-megabit chips for sale in the

near future. The drop in prices will make it less expensive for you to buy add-on boards that have lots of extra RAM for your Apple-II-series computer. Memory boards, such as Applied Engineering's RamWorks and new boards forthcoming from other companies, may soon make 1-megabyte of RAM a standard configuration for Apple-II-series computers.

What will all this new memory do for your computer? Besides giving you an enormous AppleWorks desktop space, you will be able to partition sections of memory to use as RAM-disks. Disk I/Os are fast with a hard-disk drive; they are even faster with RAM-disks. And with a program similar to Switcher for the Mac, you could load several programs into RAM at one time and switch back and forth among them easily.

JAZZ FILE STRUCTURE

Lotus originally tried to keep secret the file structure of Jazz. The company has recently changed its mind, however, and will make the file structure widely available in the hopes that it will become an industry standard. Lotus wants to encourage the development of Jazz-compatible products, and it will describe the file structures and formats for Jazz, Symphony, and 1-2-3 in a book to be published this fall by Addison-Wesley. Check with your local bookstore for more details.



MOUSEWRITE FOR THE APPLE II

If you've been following *A+* during the year, you know that Apple has been encouraging developers to use the pull-down menu, window, and mouse technology in Apple II software. After what seemed a very lengthy period of anticipation, some really good Macintosh-like programs for the Apple II have started to appear. One of the best of these programs that I've seen so far is MouseWrite from Roger Wagner Publishing, Inc., of Santee, California.

MouseWrite is a well-thought-out program that deserves consideration if you're looking for a word-processing program. One thing that really impresses me is the speed at which the windows and menus work. It is definitely worth a trip to your dealer to take a look at MouseWrite, even if only to see an example of how Mac-like software can work with the Apple II series.

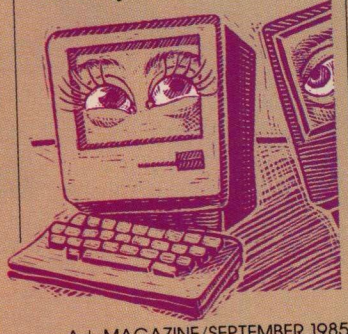
APPLE STOCK OPTIONS

Anyone who watches the stock market knows that Apple stock has been on a real roller-coaster ride this past year. The price climbed to more than $30 a share early in the year and dipped to less than $15 a share during the summer. Volatile stocks such as Apple's often attract the interest of people who trade stock options. Apple stock hasn't been part of the action, however, because up until now stock options could not be traded on stocks, such as those of Apple or Lotus, that were not listed with the New York Stock Exchange. Apple stock is listed instead with the NASDAQ exchange, trading under the stock symbol AAPL.

Recent decisions by the Securities and Exchange Commission now allow stock options to be traded on selected stocks listed with the American and NASDAQ exchanges. The stock issues that are tradable must meet certain criteria related to the size of the issuing company and how long the company has been trading stock publicly. Apple meets the guidelines and has already become a hot stock for options trading. I'll give you an update on how this situation is affecting Apple stock in an upcoming column.

MS. MAC

SmoothTalker from First Byte, Inc., of Long Beach, California, was the first sophisticated speech-synthesis software for the Macintosh. When the company promoted the original version of SmoothTalker, it promised that a female voice would soon be available. Female voices are harder to program because they have a broader frequency range and more complex sound patterns. First Byte has recently released SmoothTalker version 2.0, which has a female voice and improved speech algorithms for both male and female voices. Now all I need is to find a way to use the AppleTalk network to hook up a Mac with the male voice to a Mac with the female voice and so produce an electronic Punch and Judy show. +



CRISTINE MORTENSON

THE AMERICAN BUS NEVER LOOK

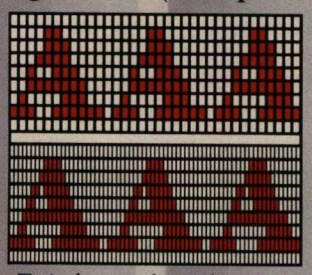
SONY BRINGS THE BRILLIANCE OF TRINITRON® TO COMPUTER MONITORS.

From now on, business people all across America can enjoy all their favorite programs on a Sony Trinitron.

Because Sony proudly unveils the first computer monitors in the world endowed with Trinitron technology. RGB monitors which, in the laudatory words of Computer Buyer's Guide and Handbook, give you "crisp, brilliant, utterly flicker-free images that take the eyestrain and headaches out of both color graphics and text or data processing."

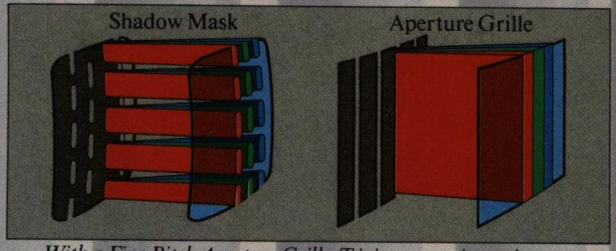
We've achieved this through technological breakthroughs that literally divide the computer-monitor world in half: Sony's, and all the others'.

First, the patented one-gun, one-lens Trinitron system itself, with a picture so vivid, so critically lifelike, it's become a legend.



Typical coarse dot pitch vs. Sony Trinitron super-fine dot pitch.

Second, Sony Trinitron's exclusive Super Fine Pitch™ Aperture Grille. It dramatically increases the number of red, green and blue electrons reaching your screen. Which dramatically increases the vibrance and brightness of the colors reaching your eyes.



With a Fine Pitch Aperture Grille, Trinitron monitors give you dramatically brighter colors than the conventional shadow mask.

And third, a dot pitch so fine, the horizontal resolution of a Sony is not only the highest in its class, but "close to that of models costing twice as much" (Computer Buyer's Guide and Handbook).

You can enjoy this extraordinary picture quality on screens ranging from 9″—the first ultracompact monitor in the business capable of displaying 2,000 characters of text—to 13″—a model that lets you switch from software to soaps at will by merging a computer monitor and full-feature TV into a single unit.

They're all compatible* with the IBM® PC, Portable PC, PC/XT and PC/AT through built-in RGB circuitry. And compatible with most Apple® and other personal computers through optional accessories.

So call Sony for further information at 1-800-222-0878 (In New Jersey, 1-800-222-0879).

Because there's no longer any reason to view your technologically-advanced computer through a technologically-deprived monitor.

SONY®
Information Products

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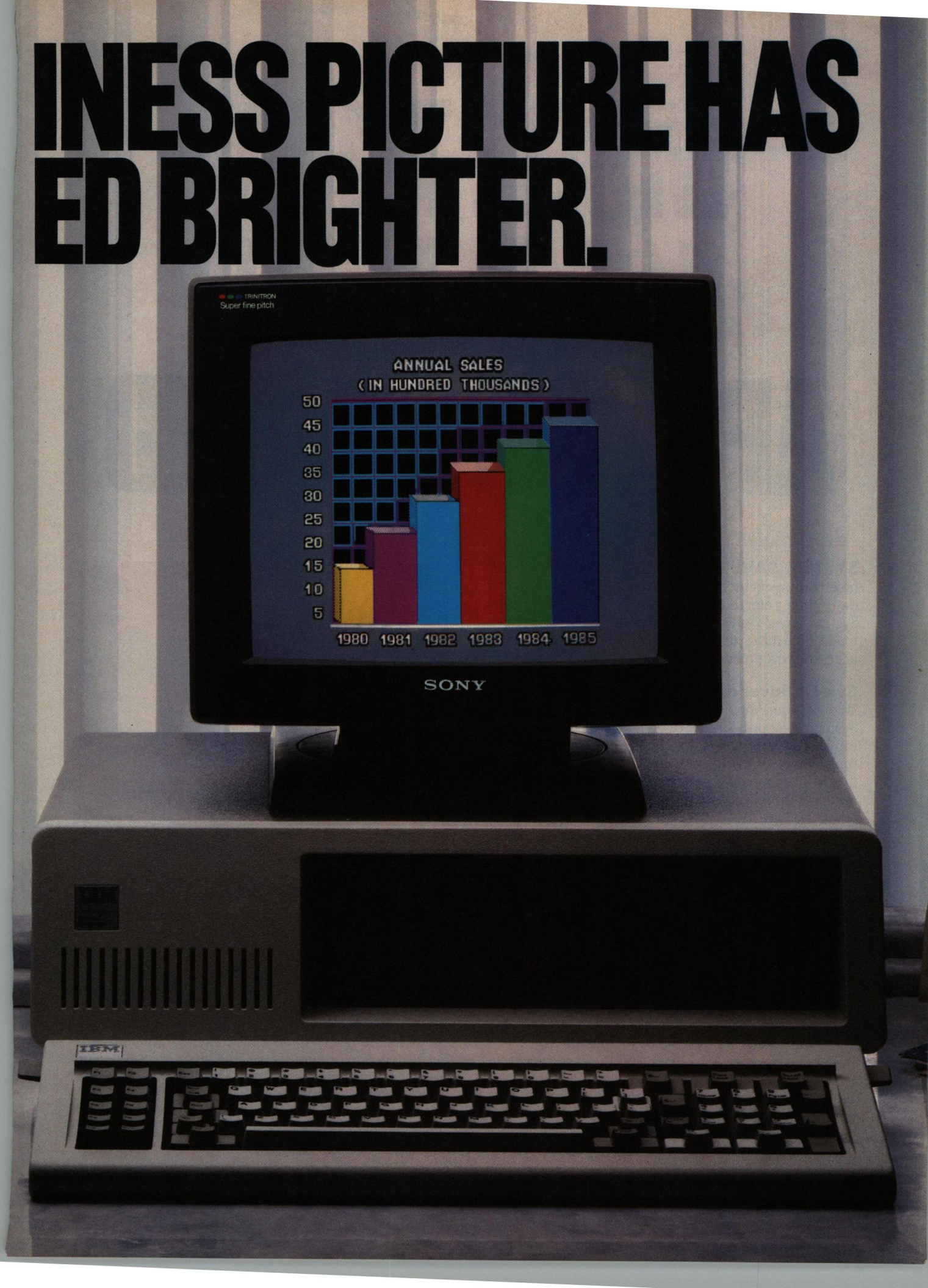
CIRCLE 194 ON READER SERVICE CARD

INESS PICTURE HAS ED BRIGHTER.

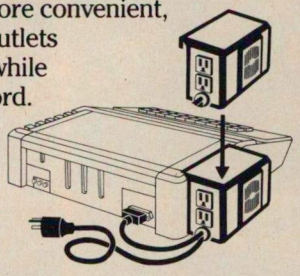


MORE THAN ¼ MILLION APPLE II's SAVED

SYSTEM SAVER® from Kensington Microware quietly protects more than 1/4 million Apple® II's every day. Often referred to as "the piece Apple forgot," System Saver's unique combination of features have made it the most versatile, most convenient, best selling accessory ever made for the Apple.

System Saver organizes your power needs.

To make your Apple system more convenient, System Saver provides extra outlets for your monitor and printer, while replacing the Apple's power cord. One front-mounted power switch controls your whole system.



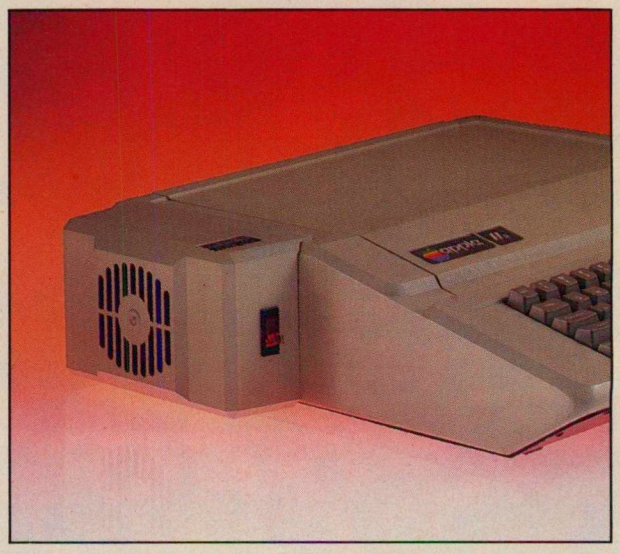
System Saver solves power line problems.

Impurities in the power supply cause 70-90% of all microcomputer malfunctions. Line noise can be interpreted as data, confusing your Apple and causing annoying system errors. Power surges and spikes can do costly damage to your computer's delicate circuitry.

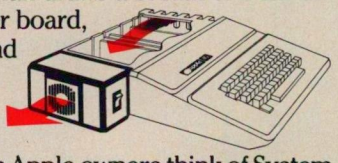
System Saver clips surges and spikes at a safe level and filters out line noise. It makes your Apple more accurate, more efficient and more reliable.

System Saver keeps your Apple cool.

Peripheral cards added to your Apple not only generate heat, they block any natural air flow through the computer. The resulting high temperature conditions can potentially shorten the lives of both your Apple and your peripheral cards.



System Saver's quiet fan draws a breath of fresh air across the Apple's mother board, over the power supply and out the side ventilation slots at the rate of 17 cubic feet per minute.



More than 1/4 million Apple owners think of System Saver as the piece Apple forgot. And 1/4 million well-protected Apples agree. Available at your local dealer. For more information, contact Kensington Microware, 251 Park Avenue South, NY, NY 10010, (212) 475-5200 Telex: 467383 KML NY.

KENSINGTON® MICROWARE

System Saver is UL Listed. System Saver's surge suppression circuitry conforms to IEEE specification 507 1980, Category A. Also available in 220/240 Volts, 50/60 Hz.

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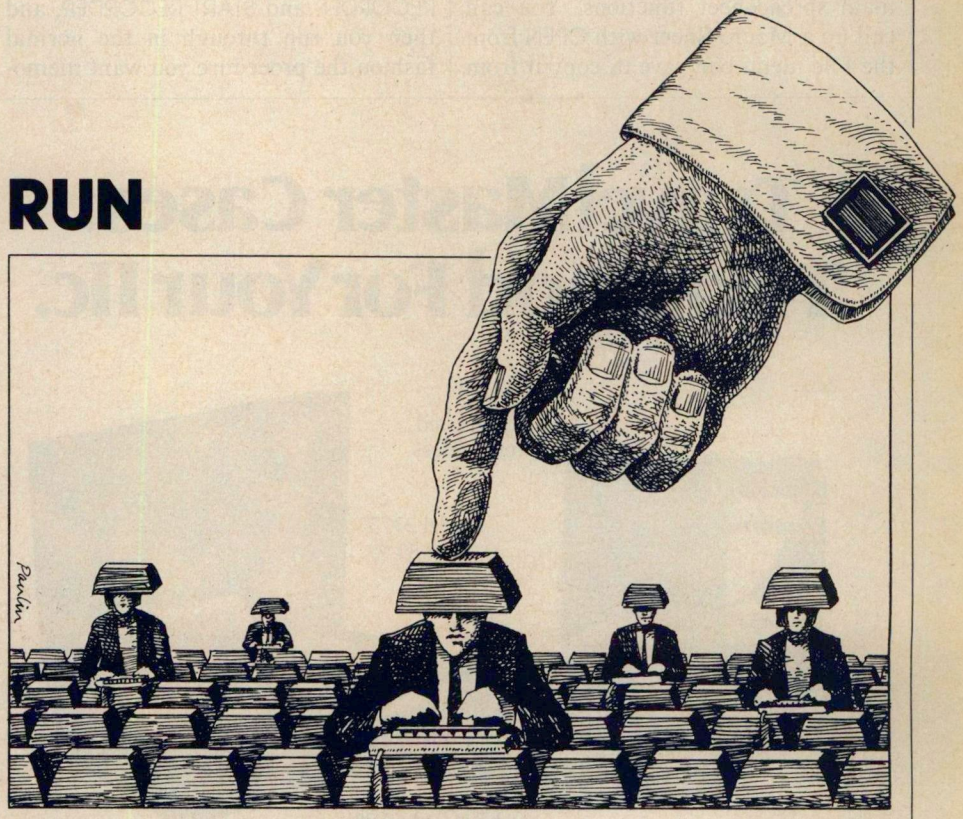
CIRCLE 134 ON READER SERVICE CARD

THOUGHTWARE
BY STEVE ROSENTHAL

How to program macros in Excel, Microsoft's new spreadsheet and charting package for the Macintosh

RUN, MACRO, RUN



Personal computers—even the Macintosh—just don't seem to learn naturally from experience. If you start the same task that you've done hundreds of times before, no glimmer of recognition flashes across the CRT screen, no rustle of past patterns steals across the memory, no habitual response takes over automatically. It's painful to have to repeat instructions in exquisite detail to a machine that ought to know better by now.

Fortunately, even though computers don't learn, they still can be taught. Give a computer clear instructions, and it will repeat them until its electronic arteries harden. Different kinds of users go about this in assorted ways.

True hackers set their lessons to the computer in assembly language, even reverting to the peeks and pokes of machine code on special occasions. The rest of us might manage an occasional BASIC program, or an excursion into Pascal. Now, however, spreadsheet users on the Mac can join in as well. Excel, Microsoft's new spreadsheet and charting package, includes extensive features that enable it to record, edit, and follow our personal instructions.

Of course, as I write this, Excel is still a prerelease product undergoing some final tweaking and polishing. As I said last month, though, I've tried out all the features discussed here, and the principles, which are the point of issue, should stay the same in the final shipping version.

Spreadsheets Demand Macros

In the spreadsheet world, a list of instructions for the program to follow is known as a *macro*, a term that in assembly language stands for a longer list of standard operations. In both assembly language and spreadsheets, invoking a macro works just as if you were telling a meticulous and tireless assistant to type in a specified set of commands at electronic speed.

Spreadsheets are particularly appropriate applications for macros. Typically, you use spreadsheets for budgets, models, and other moderately or highly complex calculations. Once you've created a model, it's used over and over.

It looks as if macros are the most striking advantage that Excel will have over Lotus Jazz.

Running a spreadsheet, however, frequently involves giving a long list of commands, especially if you want to consolidate figures or graph the resulting figures. Although you might enter new values each time you use the spreadsheet, the operation often stays exactly the same.

With a macro facility, the computer, rather than you or I, memorizes and repeats those sequences. The process not only frees us from repetitive typing, but it also means that you don't have to remember every detail of the procedure every time you want to use it. You can also set up the macro so that someone else can run it, even someone who has no prior experience with the spreadsheet or the subject it covers.

Many people would argue, in fact, that a large part of the success of the Lotus 1-2-3 spreadsheet and graphing package on the IBM PC has been due to that program's extensive macro capabilities (see article on page 117 for more comparisons). Most Lotus 1-2-3 users learn to write at least a few simple macros, and some firms sell complex 1-2-3 macro packages (known as "templates") for everything from tax preparation to sports handicapping.

DOUG PAULIN

Given Microsoft's desire to make Excel *the* spreadsheet for serious users, it's no surprise that macros were added as Excel evolved out of Microsoft's Multiplan and Chart. At least in round one, it looks as if macros are the most striking advantage that Excel will have over Lotus Jazz.

In Excel, macros occupy their own worksheets, organized in the same type of row-and-column format found in the main spreadsheet functions. You can call up a Macro Sheet with OPEN from the File menu bar, save it, copy it from disk to disk, and print it out.

Eventually, if you're a serious Excel user, you'll want to learn some of the special macro commands. At the start, though, you can use the macro facility in the Record and Replay mode.

If you create a Macro Sheet or select one with enough empty cells, you can then tell Excel that you want it to record your actions to the Macro Sheet. You pull down the Macro menu to SET RECORDER and START RECORDER, and then you run through in the normal fashion the procedure you want memorized. When you've finished, select STOP RECORDER.

As you work through your procedure, Excel captures each of your actions as the corresponding macro command, which it then inserts into the next free cell of your Macro Worksheet. Even if you don't know any macro language at all, you can create a complete macro just by recording the normal procedure you use to get your work done. When you're done, you can give a macro a name, or you can assign it to a command-key/letter combination. If you choose the latter, then any time in Excel that you can enter a keystroke, holding down the command key with the letter you've chosen starts up the macro.

Even if you don't know any macro language at all, you can create a complete macro.

If you're a programmer, you can also create macros from scratch, entering the commands in the worksheet just the way you would enter formulas or comments in the main spreadsheet. When you bring the Macro Worksheet up on the screen, you can move around with the mouse; cut, copy, and paste; plus use many of the worksheet editing commands.

No matter how you enter the macro the first time, you can change it around by editing it the way you would a spreadsheet. If, for example, you recorded a macro that consolidated figures from eight regional offices, and your firm now has nine, you can drop into the worksheet, make your way down to the proper line, and add or change the appropriate commands.

A Wide Range of Commands

The actual macro command set in Excel includes an extensive set of choices. For a starter, you have command equivalents for most of the pull-down menu-bar choices. You can also use the full set of functions and operators available in spreadsheet formulas.

Operations you normally do with the mouse also have macro equivalents, although they're more easily entered through the recorder than by typing in the commands directly. To use the Scroll command, for example, you have to tell it what percentage of the way down or over you want the scroll-bar

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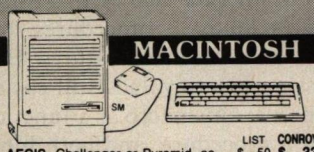

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elevator to move—figuring out what percent some number is of 16,384 is not an intuitive experience for most of us. You can also invoke SELECT to choose regions of the spreadsheet that you would normally click on with the mouse.

The menu choices, formulas, and mouse equivalents let you tell Excel what to do, but they don't feed back much information, and they certainly don't let you customize procedures depending on the values they encounter. If you're willing to do some high-level programming, though, Excel macros can test for values, make decisions, and jump to selected locations.

Two other features make the testing and decision capability particularly valuable: Macros can call other macros, and macros can pass parameters to other macros.

Because a macro can call another macro, you can pick the appropriate procedure for a situation depending on the precise input values. You could, for example, process a payroll calculation differently for employees eligible for overtime than for those who were not. In another example, depending on whether sales figures were over or under plan, you could add in or skip over bonus payments.

Just as important, because you can call one macro from another, you don't have to try to jam everything into one large project that's difficult to debug and even harder to keep up to date. In the same way that one cell on a spreadsheet can refer to another cell, a macro in Excel can call on another macro and either transfer control permanently or execute functions in the other macro and then regain control. You can then write small macros, get them working and refined, and use them as building blocks for your larger projects.

You can write small macros, get them working and refined, and then use them as building blocks for your larger projects.

Furthermore, just as Excel and Multiplan spreadsheets can refer to cells in other spreadsheets to build up complex consolidated models, macros can invoke other Macro Sheets (providing the named sheet has been opened and is available). Thus, you can build large libraries, create templates for use or sale, and optimize macro collections for particular spreadsheet applications.

Just having the ability to invoke one macro from another makes it possible to link most kinds of procedures, but Excel has two further features that make passing macro values still easier. You can define any macro as a function instead of a procedure, and both function macros and command macros can be set up with symbolic parameters.

A Question of Function

Function macros resemble normal command macros, with two slight but important differences. First, a macro function, like a built-in function, produces and calculates a single value (or a single set of values for array functions) every time you invoke the function. Second, you can use a named function in any formula or cell. You can even use the functions you create as part of another function. If you have created a named function that calculates sales tax, for example, you can use it any-

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• Uses Chinon Pinch-type mechanics • 143K formatted • 35 tracks • Super quiet • Works with Apple Controllers or other compatibles (ACC-1) above • Complete with connector — just plug into your controller • Size: 5¾"W x 1⅝"H x 8"D • Wt.: 4 lbs.

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• Same specs as ADD-12 (above) except no controller necessary.

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80-Column plus 64K RAM for your APPLE *IIe**

Now you can double the memory capacity and get an 80-column display format for your APPLE *IIe** computer at an affordable price. Just plug the JE864 card into your APPLE* and expand your display to 80 characters per line. Perfect for word processing. The JE864 also features 64K bytes of additional memory to allow programming not possible with standard APPLE *IIe** computers. Complete documentation included.

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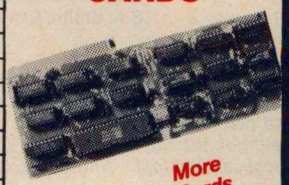
APPLE* COMPATIBLE CARDS



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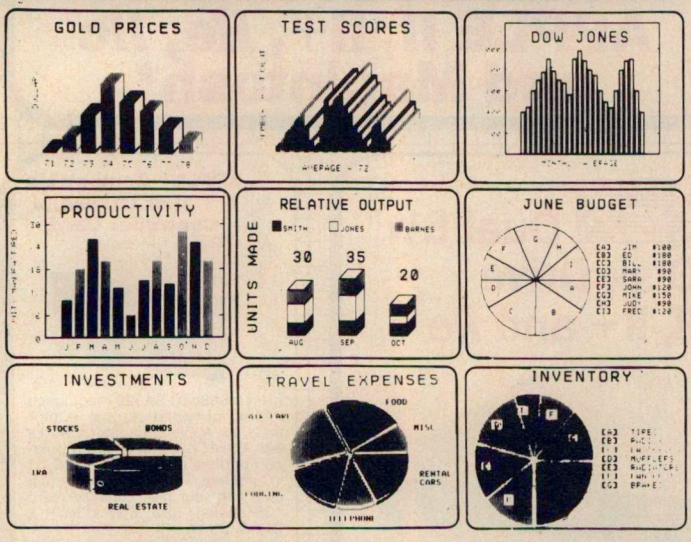
CIRCLE 279 ON READER SERVICE CARD

AlphaChart!



Don't pay more for less! The pictures shown above are examples of charts created with AlphaChart!, perhaps the most powerful and friendly Apple II chart program on the market. Within seconds, keyboard-entered data can be converted into picture-perfect pie or bar charts, in 26 user-selectable styles, automatically scaled and labelled, and in color or black and white. And if you want to customize your charts by adding extra artwork or text, or display them in a slide show, AlphaChart! comes with these valuable extras.....

A **slide projector,** for orchestrating automated, stand-alone screen presentations of a series of charts, timed and sequenced by the user. This program alone is worth the cost of the disk. It can be used with any graphics files created with any program.

A **graphics editor,** for alteration and embellishment of charts. Besides standard point-by-point sketching, built-in structures permit push-button creation of circles, rectangles, lines, shape-table shapes, and exotic woven plaid patterns. If you wish to add clarifying text to the charts, you may type on the screen in several different letter font styles. For the artist, the graphics editor can also be used to sketch any imaginable scene from scratch.

A **shape table editor,** for creating special shapes for your charts. These shapes can also be used for animation in your programs! A sample animation program shows how to do it.

AlphaChart! includes a screen-dump program for printing your charts on paper. AlphaChart! is more! Just read what these people have to say about it...

"I noticed the advertisements for Spectral Graphics' AlphaChart! program and figured that, with a money-back guarantee, I would try it. Boy, am I glad I did! This is a fantastic program You can master its many varied capabilities in less time that it would take to describe them. I would recommend it to everyone, even if you have absolutely no need for a graphing program. It's just fun to play with." **S.A. Smith, San Bernadino, Calif.. . letter to SOFTALK, June, 1984, page 14.**

"The software does much more than the advertisement suggests. Without question, this is among the best buys in software that I have ever come across, and certainly among the best written. It is extraordinarily easy to use, very well thought out, and priced to kill your competition (which I wish you every success in doing)." **Anthony J. Scriffignano, North Caldwell, New Jersey.**

"I have long been distressed by the lack of software available in the scientific academic community. At last there is a simple yet robust graphics program applicable for our purposes: AlphaChart!, by Spectral Graphics Software. Business folks and scientists alike will really appreciate how user-friendly it is; I was able to produce my first three-dimensional, multi-colored, labeled bar graph within five minutes of booting the disk-without reading my documentation. I would have had to pay a scientific illustrator much more than the whole program costs just to produce that one graph. . . . you can't do without this gem." **John B. Iverson, Richmond, Indiana. . . letter to SOFTALK, April, 1984, page 23.**

ONLY $29.95 Apple II+/IIe/IIc. Satisfaction guarantee or your money back (really!). Send a check or purchase order to **SPECTRAL GRAPHICS SOFTWARE,** 6333 Pacific Avenue, Suite 256, Stockton, California 95207. Or call (209) 463-7309 for COD orders and dealer inquiries. AlphaChart! is not yet sold in most stores. All orders are shipped immediately and are in your hands within three days.

CIRCLE 109 ON READER SERVICE CARD

where that you could have entered a similar-format numeric value or cell reference.

Functions, of course, are most serviceable if you can specify input values for use in their calculation. Excel allows both command macros and function macros to accept inputs. You can supply input values to a command macro you call directly from the pull-down menus with the Run command or with a macro keystroke. Those invocations don't have any place for input values, but you can use one of these macros to call a second macro, which in turn asks for input values.

Being able to accept input parameters amounts to more

The lesson of the marketplace seems to be that spreadsheet users are serious about their business and are willing to invest in their tools.

than the ability to read numbers from cells on the spreadsheet. When you define a macro with parameters, Excel substitutes the calling values each time for the placeholder names you used in similar order inside the macro. As with a built-in function, the parameter-passing feature allows you to write macros for a general case rather than just for a particular spreadsheet.

For example, suppose you were working up a complete set of financial spreadsheets for your personal income and expenses. Many of your projections might depend on the future tax rate. Instead of putting the tax rate in every command macro and function, it would be convenient to have a macro that you could use throughout the project to make that computation.

If you were to define a very simple Taxes macro to calculate your tax on income, you could, for example, use TAXRATE throughout the macro to stand for the actual portion of gross income for taxes. Your Taxes macro would then include two cells—one saying ARGUMENT(TAXRATE,1) and one saying ARGUMENT(TAX.INCOME,1)—in order to associate the numbers furnished by the macro invocation with the names TAXRATE and TAX.INCOME, respectively. (The *1* in the Argument command means the parameter will be a number.) Then, if your General Financial Statement macro calls Taxes as TAXES(0.3,20000), the 0.3 will be substituted in the macro for every occurrence of TAXRATE and the 20000 for every occurrence of TAX.INCOME.

Is There a Net Gain?

With macro-to-macro calls, parameter passing, and a choice of command or function forms, Excel seems closer to Pascal or C than to a simple keystroke memorizer. If you care to learn macro programming, Excel's macro language is ready for anything you can do with a spreadsheet.

Do you need all this power, and is it worth learning? The lesson of the marketplace seems to be that spreadsheet users are serious about their business and willing to invest, both financially and temporally, in their tools. If you're sufficiently involved with business finances to work regularly with a high-capacity spreadsheet, you probably also know that raising employee productivity also raises the bottom line. The FV (future value) of macros on micros can indeed be significant to many figures—one of whom could be you. ✚

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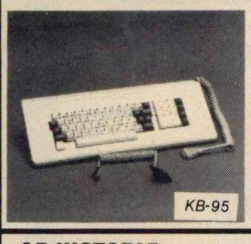

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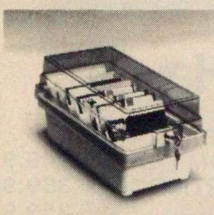

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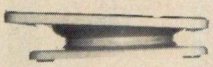

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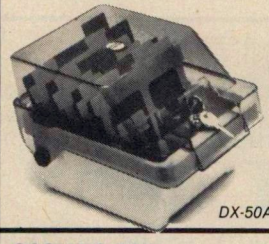

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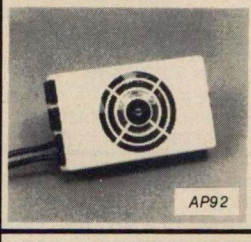

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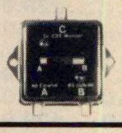

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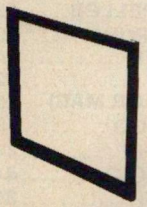

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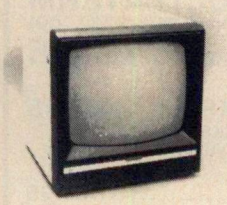

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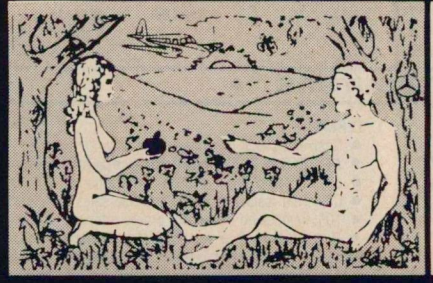

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CIRCLE 262 ON READER SERVICE CARD

ACCOUNTING

▶ APPLEWORDS
BY STEVE ROSENTHAL

A short glossary of terms for use with our "Apple Means Business" series, beginning on page 26 in this issue

ACCOUNT
A category for entering financial transactions, such as a particular kind of income, expense, or capital investment.

ACCOUNTS PAYABLE
In accounting, money owed to suppliers and others for normal operations. It is the main item included in *current liabilities*.

Also, a software package or module that keeps track of payments to suppliers. Typical features include vendor records, distribution of amounts to multiple accounts, generation of checks, automatic and manual payment orders, and summarization for a general ledger.

ACCOUNTS RECEIVABLE
Money due from customers for goods or services already delivered. Normally, this category doesn't include long-term obligations.

Also, a program or module that keeps track of amounts due to the business. Common features include generation of invoices and statements, tracking of payments, lists of aged (past-due) items, and summarization for inclusion in a general ledger.

ACCRUAL OR ACCRUAL BASIS
An accounting method that assigns expenses and income to the period in which they are earned or obligated, rather than when they are actually paid.

ASSET
Any item that has economic value. Assets can be tangible (such as machinery or land) or intangible (goodwill, copyrights, and so on). Most accounting packages let you categorize assets into various accounts.

AUDIT TRAIL
The recording of sufficient information in the records of a system so that you can follow each individual transaction through the system into any summary or balance, and so that any composite value can be decomposed into the original transactions.

BALANCED
In double-entry bookkeeping (which records where funds come from as well as where they go), summing to equal values on the credit and debit side of the ledger.

BALANCE SHEET
A listing of the financial status of an organization or individual, typically showing assets, liabilities, and equity.

CAPITAL ASSET
An item acquired for use in a business, rather than for consumption or sale.

CASH OR CASH BASIS
An accounting method that assigns income and expenses to the date on which the payments were actually made, rather than to the date when they were obligated or earned.

CASH DISBURSEMENT
Cash in most bookkeeping contexts means both currency and checks; cash disbursements, therefore, are generally made through one or more checking accounts.

CHART OF ACCOUNTS
A list of the accounts used in a set of books, often annotated to show how entries in some accounts are summarized in, or added to, other accounts.

COMPOUND ENTRY
A transaction that shows up more than two places on the books. Changes in a company's capital structure, for example, often give rise to such entries. Also called *combined entry*.

CREDIT
A transfer into an account.

DEBIT
A transfer out of an account.

DIF
Short for Data Interchange Format, a file format created by Software Arts to enable their VisiCalc program to exchange data with other programs. Many financial and database programs now read and write DIF files as one method of exchanging data with other programs.

DOUBLE ENTRY
A bookkeeping system that records for each transaction both where the funds came from and where they went. Seeing whether the two sides of the transaction balance, both in detail and in summations, forms a cross-check to minimize errors. Most business-accounting packages use a double-entry system, but most home packages use the simpler single-entry approach.

FIXED ASSETS
Items of value that a business expects to use for a long time (generally a year or more). Fixed-asset software typically includes depreciation, special investment tax credits, gain and loss, and posting to general ledger.

GENERAL LEDGER
A main listing of accounts and balances used as the central summary of a set of books. Most medium- and larger-size businesses also use more detailed ledgers to record further details of certain accounts.

Also, a software package that does the overall accounting for a business. It often requires companion programs or modules to handle the details of such categories as payroll, inventory, accounts payable, and so on.

JOURNAL
A record of transaction details, often containing only one type of transaction. For example, a receipts journal or check journal.

LEDGER
A listing by account of transactions or balances. Transactions are first listed in journals and then posted to the appropriate ledgers.

PAYROLL
In financial software, a program or module that computes paychecks according to wages, hours worked, taxes, and other withholding.

POST
To include a transaction or intermediate sum in a larger composite, such as adding or subtracting a journal entry into a ledger.

SIMPLE ENTRY
A transaction that appears on the book as a single debit plus a single credit.

TRIAL BALANCE
Originally, this meant an addition of the debit and credit sides of a double-entry ledger to see that they agreed (because each debit should have a corresponding credit). Increasingly, the term is being used to mean a balance taken during an accounting period before the books are closed. +

APPLE MEANS *Business*

BY NANCY K. DIRKSEN

DOUBLE-ENTRY ACCOUNTING

As computers have become less expensive and more powerful, more companies are using them to help manage the huge amounts of business data that they need to process. Because of the tremendous benefits they can obtain right away, accounting is often one of the first functions that companies computerize. As a result, several accounting packages are now available.

This article looks at two of these packages: The Advanced Business Accountant from Manzanita and The Debit Credit Connection from Solitaire.

Before looking at the individual products, let's determine what types of features are important. Most companies want an accounting system flexible enough to handle their business both now and in the future. It should also be easy to use—the people using the accounting system will most probably be accountant/clerks and not computer programmers. Accounting software should also provide safeguards that automatically deter users from making errors and should actually help its users to do their jobs more efficiently.

Manzanita: Power and Flexibility

Manzanita's The Advanced Business Accountant is by far one of the most flexible, powerful, and easy-to-use accounting packages available for any computer. It can handle all aspects of running a small- to medium-size business through the comprehensive General Ledger and its Accounts Payable, Accounts Receivable, Inventory Control, and Payroll modules. You can use any of the modules separately, or combine them to create a fully integrated business system.

Manzanita's double-entry accounting package is designed to take advantage of the Apple IIe's special features. It requires the use of a hard disk utilizing the ProDOS operating system, which gives the product its power.

> Two powerful yet simple packages for the Apple II

The Advanced Business Accountant gives users a highly advanced, easy-to-use accounting system that encompasses multiple account designations, divisions, and departments. The General Ledger can maintain up to 1000 six-digit account numbers (four for the accounts and two for the department), with 12-month budgets maintained for each account number. You can enter up to 20,000 journal entries each month. In addition to the five subjournals (General Journal, Cash Receipts, Cash Disbursements, Sales, and Purchases), the General Ledger also generates multiple-category mailing lists.

In fact, The Advanced Business Accountant's capabilities are limited only by the size of your company. It can handle numbers up to $43 million with accuracy. (After that, it begins to round off.) Therefore, if the total assets of your company are more than $43 million, this accounting system is probably not for you.

Built around the best accounting standards—for example, it does not accept unbalanced equations—the software posts entered data automatically to all necessary modules, which allows it to generate up-to-the-minute financial-status reports. You can print all reports either to the screen or to the printer, making audits or account inquiries both easy and efficient.

The types of reports that you can generate automatically seem to be limitless, and if you don't have the time to wait for the physical printing, you can just spool the desired reports. The modules can also convert your data into the AppleWorks spreadsheet file format, allowing you to combine its automated accounting features with the analysis and data manipulation that's necessary for such jobs as generating annual and long-term business plans.

In addition to the sheer power of the accounting tool, Manzanita has made this package easy to use, especially for first-time computer users. Hundreds of help screens guide you through every phase of the accounting process; at any time, you can call upon windows containing the chart of accounts, chart of part numbers, customer and vendor charts, and the like.

Although this is an amazing product, it is not for everyone. Because it requires the use of a hard disk, the initial hardware investment is considerably higher than that for floppy-disk systems. Also, not every company needs the power or the flexibility of The Advanced Business Accountant. When you buy it, though, you really do get what you pay for.

Debit Credit: Good for Business

If you don't need the power of The Advanced Business Accountant, Solitaire's The Debit Credit Connection

JOHN ROBINETTE

may suit you better. This package doesn't try to be all things to all businesses; instead, Solitaire has created a product that's easy to use and appropriate for most small- to medium-size companies. It addresses only the General Ledger/Journal function.

Like The Advanced Business Accountant, The Debit Credit Connection is based on the double-entry accounting method (standard for most manufacturing and retail firms), and it has built-in safeguards and help messages that prevent you from committing serious follies. For example, similar programs advise against using your master disk for everyday processing, to ensure that you do not accidentally destroy it. The Debit Credit Connection goes one step further: its master disk is protected so that you can use it only to make copies of itself. When you use the program, you must use the copy of the master disk.

The program is also designed to protect your data. How many of us have heard woeful tales of users losing hours of data because they failed to make periodic backups of entered data. This lackadaisical attitude doesn't represent problems when you use The Debit Credit Connection, because after you have made 100 entries, the program automatically saves the entries onto the disk. (It is still highly advisable, however, to make backups more frequently.)

The program has a total capacity of 100 accounts (5 income, 15 asset, 15 liability, and 65 expense). It also provides budgets, or "goals," for each account. This scenario should be more than adequate for most small- to medium-size businesses. The disk-storage capacity of 2376 transactions (or 193 a month) is this product's only limitation.

The Debit Credit Connection posts transactions to accounts when you first enter them, which gives management access to the most current information possible. At the end of the year, the program automatically rolls over all the appropriate accounts while zeroing out the monthly and year-to-date balances. In order to start a new year, you need only generate new master and data disks, and you're ready to go.

You can add new accounts to your chart of accounts at any point. You can also change the name of any existing account at your discretion. The one thing you cannot do is delete an account or change balances after the program has posted a transaction to the account, which is a nice safeguard against destroying necessary audit trails.

You can use 50 automatic transactions to save time and decrease error sources. These transactions occur on a regular basis—that is, depreciation, amortization of prepaid expenses, bank charges, and so on. By having two automatic-transaction files, the program offers additional flexibility in the management of funds—you can spread these regular expenses out over the entire month, for example.

The Debit Credit Connection was written for nonaccountants. It does not rely on standard accounting language, but uses straightforward, ordinary English. Despite its name, you do not have to deal with debits or credits because the program's design is like a series of shoe boxes—the process of accounting is simply the transfer of funds from one shoe box to another.

The everyday terminology might, at times, be an obstacle to studied accountants. Certain terms in accounting have very different meanings in English, and accountants may have difficulty leaving such mental baggage behind. The explanations for nonaccountants are excellent, though, and, with a little effort, even seasoned accountants will be able to understand the inner workings of this program. ✚

Nancy K. Dirksen is a traditional accountant who has come to appreciate the wonders of the Apple II.

▸ PRODUCT INFORMATION

The Advanced Business Accountant
Manzanita Software Systems
One Sierra Gate Plaza, Suite 200-A
Roseville, CA 95678
(916) 781-3880
List Price: System Manager, $95; Payroll, $445; other modules, $395
Requires: Apple IIe, 128K RAM, ProDOS, hard-disk drive
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The Debit Credit Connection
Solitaire
2255 Overlook Circle
Bloomington, MN 55431
(612) 888-2077
List Price: $119.95
Requires: Apple II Plus, IIe, or IIc; 48K RAM; floppy- or hard-disk drive
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85-39 213th Street Queens Village, NY 11427
References: Barclays Bank of New York (718) 454-1900, D & B #130151913.

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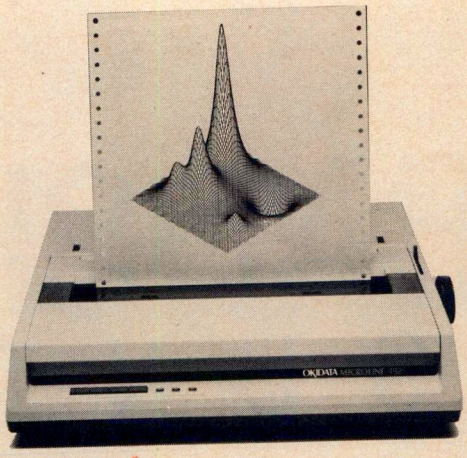

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APPLE MEANS *Business*

BY NANCY K. DIRKSEN AND W.M. MILLER, JR.

SPREADSHEET ACCOUNTING

For a small business to succeed, the people who are running it must always have access to the best accounting information they can get.

Getting that information usually requires that a company spend enough money for an independent or staff accountant, or, alternately, you can fumble through manuals and books yourself, hoping to figure out all the nuances of the accounting process.

In either case, though, you need that information. Just because your company is small doesn't mean that you don't require the same attention to accounting records that a larger corporation does. In fact, just the opposite is true. Large companies have capital and credit lines to fall back on if they hit hard times. Your very existence as a small company, though, can be in jeopardy if you don't constantly maintain a healthy financial position.

The fact that you must be vigilant doesn't necessarily mean that you need manpower. With a computerized accounting system, you can let your Apple do most of the hard work for you. Many accounting packages are available today, and they cover the most sophisticated types of applications. If your needs are relatively simple, however, you can probably handle much of your accounting with any standard spreadsheet program, such as VisiCalc, SuperCalc, FlashCalc, AppleWorks, or Multiplan.

This article demonstrates how, through the use of simple spreadsheet templates, you can easily set up a logical accounting system. It should work fine for most small businesses that use single-entry, cash-based accounting methods. All the procedures proposed here are consistent with standard accounting principles and are divided into the major components as required by the Internal Revenue Service.

Let a standard spreadsheet program do most of the hard work for your small business.

JOHN ROBINETTE

Meet the System

First a quick summary of how an accounting system based on a spreadsheet works. Two templates serve as the backbone for the system: an expenditures template and a receipts template. All you have to do from day to day is enter into these templates the money you spend and the money you receive. The system will then move the numbers and build a summary report automatically.

EXPENDITURES
MONTH: JULY 1984

DAY	PAID TO:	CHECK NO.	ACCT.	AMOUNT
1	CHARLES BENTLEY CO.	205	1	185.00
5	SEARS ROEBUCK	206	12	26.85
6	CHARING CROSS HARDWARE	CASH	5	8.57
12	MICROCOMPUTER CENTER	207	7	26.25
16	STATE OF MARYLAND	208	10	56.52
17	BELLMAN PROMOTIONS	209	11	275.00
23	A.S. ABEL CO.	210	2	18.96
25	EQUITABLE BANK	DEDUCTION	3	5.17
27	S. LAROSE CO.	211	1	145.79
..	.....	....		.....
..	.....	....		.....
		TOTAL		748.11

Figure 1: To establish the Expenditures template, create columns for date, description, check number, account number, and amount.

The value of using templates like these instead of a manual accounting system becomes clear when you make an error. For instance, if you enter an incorrect account number, you have only to go back once and reenter the correct one. The spreadsheet program then makes that change automatically at all the necessary locations and corrects all the totals.

Chart of Accounts

Start by establishing a Chart of Accounts so you can categorize your expenditures and receipts.

The Chart of Accounts is made up of a series of account codes—numerical values given to classes of expenditures or revenue sources. Each account code defines a unique category. Generally speaking, these specific account codes are also grouped into broader categories. For instance, you might establish revenue accounts as 1–10, and expense accounts as 20–50.

It's a good idea to leave some in-between numbers empty, so that you can assign them later as your business grows. (It is much easier to have extra account numbers now than it is to add them later on.)

Master Template: Expenditures

Once you've established your chart of accounts, you can begin creating the actual templates.

To establish the Expenditures template (see figure 1), create columns for date, description, check number, account number, and amount.

All cells except those requiring user

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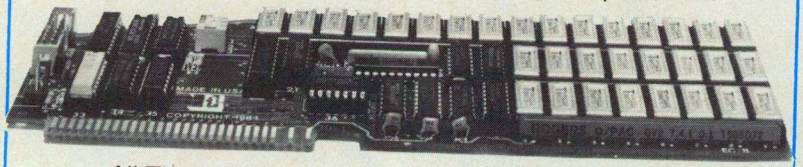

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input are locked to protect them from accidental modifications. Initially, the cells that do require input contain either a zero or dots to help ensure that you remember to enter all pertinent information for each accounting event.

Data entry into this template is fairly straightforward. You make an entry whenever funds are used, and you note

With a computerized accounting system, you can let your Apple do the hard work for you.

the method of payment. By using the summation function to add all the entries in the amount column, you can always have a running total of expenses during the month.

Adding a blank line between your data entries, incidentally, can prove useful in the future. For instance, you can use this line to give additional information about a given transaction—which invoice was paid, which month's rent was paid, what supplies were purchased, and so on.

RECEIPTS

MONTH: JULY 1984

DAY	SOURCE	NET AMOUNT	SALES TAX	GROSS AMOUNT
3	S. JOHNSON	400.00	20.00	420.00
18	ROY VANDEVANDER	300.00	15.00	315.00
24	JOYCE HARKINS	250.00	12.50	262.50
26	MARION COTTRELL	800.00	40.00	840.00
28	LLOYD WEBER	600.00	30.00	630.00
..	.....	.....	.....	.....
..	.....	.....	.....	.....
	TOTALS	2350.00	117.50	2467.50

Figure 2: To establish a template for receipts, create columns for date, description, net amount, sales tax, and gross amount.

This particular template can also function as your check register if you make all your payments by check.

Master Template: Receipts

At another location on the same spreadsheet, establish a separate template for receipts (see figure 2). Create columns for date, description, net amount, sales tax, and gross amount.

Use the summation function in two places: to add up the gross sales figure of each entry (net amount plus sales tax) and to total each individual column. (By using the summation function in both places, you establish an internal check to ensure the proper addition of sums.)

This template gives you a running tally of your income for the month, as well as the current status of your sales-tax liability.

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Once again, you can leave an explanation line between the entries. In this case, you might use it to match a customer's payment to an outstanding invoice, or to provide any information regarding special payment terms.

1	2	3	4	5	6	7	Acct.
185	0	0	0	0	0	0	Matrix
0	0	0	0	0	0	0	
0	0	0	0	8.57	0	0	
0	0	0	0	0	0	26.25	
0	0	0	0	0	0	0	
0	0	0	0	0	0	0	
0	18.96	0	0	0	0	0	
0	0	5.17	0	0	0	0	
145.79	0	0	0	0	0	0	
				0	0	0	
				0	0	0	
330.79	18.96	5.17	0	8.57	0	26.25	Totals

Figure 3: The first step in creating a Summary template is to establish an Expense Summary Matrix to isolate values according to each separate account.

With the creation of the Expenditures and Receipts templates, you have covered the basics. To work the system, do the following: When you spend money, enter the expense into the Expenditures template; when you receive money, enter the amount into the Receipts template.

Summary Template

Now comes the fun part. If you dutifully enter all this information into your spreadsheet, you can automatically create a summary report that shows how your business is doing, day to day and month to month.

You create the Summary template right on the same spreadsheet. First, you need to establish a matrix (see figure 3) to isolate values according to each separate account. For each account number, set up a separate column. Each column has one cell to match each individual transaction.

For instance, if you write 20 checks every month, each column must have at least 20 matching rows. (It's a good idea to build in some slack from the beginning—you might want to start with 30 rows so you'll have them later when your business expands.)

Then, in the first matching cell of each column, create an if<then statement, so that the statement is true only if the expense of that transaction belongs in that column. For example, if a particular cell is designed to check for account number 22, you might create a VisiCalc formula that reads:

```
@IF (D10-22=0),D11,0)
```

In other words:

If D10–22=0, then insert the value from D11 into the cell; otherwise, insert 0 into the cell.

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• MK-82 Bombs	Yes	Yes	No
• Air-Air Missles	Yes	Yes	No
2. Sophisticated Electronics			
• Heads Up Display	Yes	Yes	No
• Radar	Yes	Yes	No
• Electronic Counter Measures	Yes	Yes	No
• Inertial Navigation	Yes	Yes	No
3. Real Combat Missions	Yes	Yes	No
4. Developed and Tested by Real Fighter Pilots	Yes	Yes	No
5. Aerobatic Flying (Loops, Splits, and YoYos)	Yes	Yes	No

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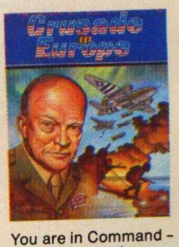

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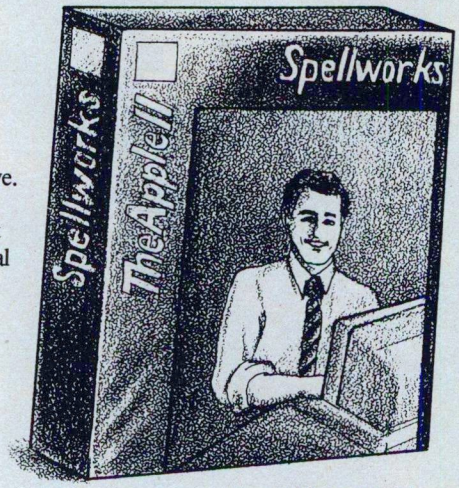

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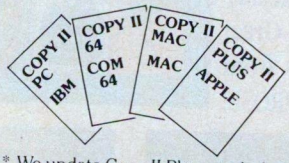

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CIRCLE 185 ON READER SERVICE CARD

This means that if D10 is account 22, the value of that transaction (D11) goes into this cell. If it does not belong in account 22, a value of 0 is placed in the cell.

After you have created a unique if<then statement in the top cell of each column, replicate the value down the entire column. Then use the summation function to total each column, in order to figure your expenditures by account.

Note that this matrix can take up a lot of spreadsheet space, especially if you've established several accounts.

EXPENSE SUMMARY
MONTH: JULY 1984

1	MERCHANDISE-MATERIALS	330.79
2	ADVERTISING	18.96
3	BANK CHARGES	5.17
4	LICENSES	0
5	MISCELLANEOUS EXPENSES	8.57
6	OFFICE EXPENSES	0
7	POSTAGE	26.25
8	REPAIRS	0
9	CAR EXPENSES	0
10	TAXES	56.52
11	SELLING EXPENSES	275
12	SUPPLIES	26.85
13	TRADE DUES, ETC	0
14	TRAVELING EXPENSES	0
	TOTAL	748.11

Figure 4: The Expense Summary Template is built by replicating into it the summations from the matrix.

You'll probably want to select the Manual Calculation mode before beginning and then analyze all the accounts at once.

The total for each account is now ready to be transferred to the Expense Summary template (see figure 4), which you build by simply replicating into it the summations from the matrix. Label each account, and you have a summary of your business activity.

That's about all it takes. You can, if you want to, use the same basic templates with the techniques described above to create a simple income statement or a receipts-summary report. These templates can be quite time-consuming to build, but the effort is well spent. Once established, they will significantly eliminate common errors and save a great amount of effort each time you use them. +

Nancy K. Dirksen is a traditional accountant who has come to appreciate the wonders of the Apple II. As an engineering manager for the Army, Bill Miller applied personal computers to financial management of research-and-development projects. He is now a computer consultant and free-lance writer.

APPLE MEANS *Business*

BY KEN LANDIS

SUPERCALC3a SPREADSHEET

If there were a "Microcomputer Masterpiece Theater," one of the episodes would be set in Cambridge (Massachusetts, of course) in a small room not far from the halls of Harvard and MIT. The first episode would focus on two scraggly looking graduate students and their quest to invent an "electronic blackboard." After 20 episodes (and 20 fund-raising drives) you would learn that you had just watched the conception and birth of VisiCalc, the first spreadsheet program ever developed—which, I might add, was developed on an Apple II.

Next season, the episodes would involve the intrigue; the competition; the envy; and finally, the death and/or fading away of our friend VisiCalc. When the smoke cleared, the winner, standing tall, would be SuperCalc3a from Sorcim/IUS Corporation.

The SuperCalc3a Saga

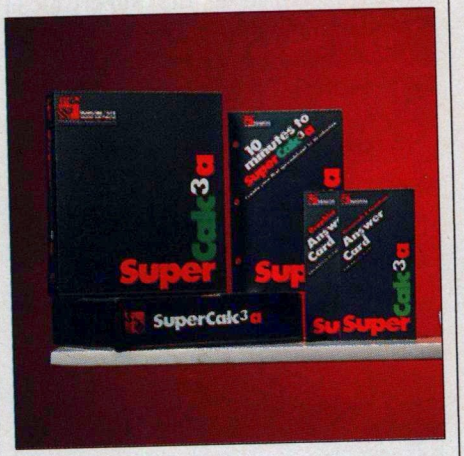
Over the last few years, the majority, if not all, of the advances in spreadsheet technology have been in the IBM PC arena. SuperCalc3a represets a reversal of that trend.

Some of SuperCalc3a's features require functions available only with the new 65C02 processor, so you will need an Apple IIc or enhanced IIe to run the program.

In addition to "standard" spreadsheet functions (including many enhanced features), SuperCalc3a has a graphics program; a database manager; an Apple/IBM communications program; and Sideways, a program that lets you print wide reports "sideways" on the printer so you don't have to cut and paste.

The only way to learn about SuperCalc3a is to take a tour of its functions. So, ladies and gentlemen, our first stop is the spreadsheet.

The latest advance in spreadsheet technology is in the Apple arena.



The Spreadsheet

Just how big is it? SuperCalc3a's spreadsheet is 254 rows down by 63 columns across, a total of 16,002 possible entries. If you've ever had occasion to push a spreadsheet to its limits, you know that the spreadsheet is limited by the amount of memory you have.

In the case of SuperCalc3a, this proviso is true and not true. SuperCalc3a uses an advanced memory manager that ignores blank cells and can give you up to 300% more cells than your memory would normally allow (selling point number 1).

In terms of inherent power, SuperCalc3a has more than 50 built-in functions)—no more or less than the number that many other spreadsheet programs have, but the requisite amount.

What can you do with the output of your calculations? You can format the numbers with dollar signs, floating decimals, and commas; put negative numbers in parentheses; center, left-justify, or right-justify them; and on and on. Maybe you can't make the numbers add up the way you want them to (a smaller amount at income-tax time, for instance), but you can make them look the way you want them to (selling point number 2).

A feature that another spreadsheet pioneered just a few years ago was the ability to consolidate similar spreadsheets into one. A good example of a use for this function is consolidating budgets from different departments. SuperCalc3a also has this ability (selling point number 3).

Other valuable features are the ability to protect cells (so your cousin Harold doesn't lose a formula that took you 15 minutes to enter), to "hide" columns on the screen so you don't have to look at intermediate calculations, to vary individual column widths, and to store keystrokes so you can develop "canned" applications with the program.

Some spreadsheet programs limit the number of characters you can key into a formula, a severe restriction on their effectiveness. SuperCalc3a allows up to 116 characters per formula. If that length isn't sufficient, you can link multiple cells together into one formula. SuperCalc3a has an excellent online help facility called Answerkey. Just enter a question mark, and a great crib sheet pops up on the screen. The Answerkey responses automatically adjust for the options you have at hand.

I have worked with many spread-

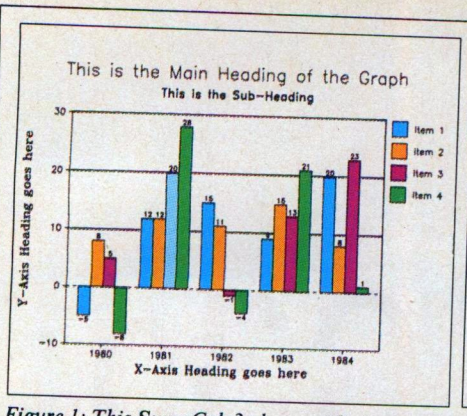


Figure 1: This SuperCalc3a bar graph shows some of the graphics options available, including user-selectable typestyles and plotting colors.

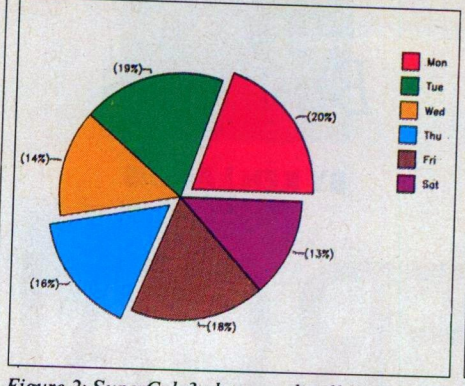


Figure 2: SuperCalc3a lets you distill hundreds of pieces of information into one simple picture, such as this exploded pie chart.

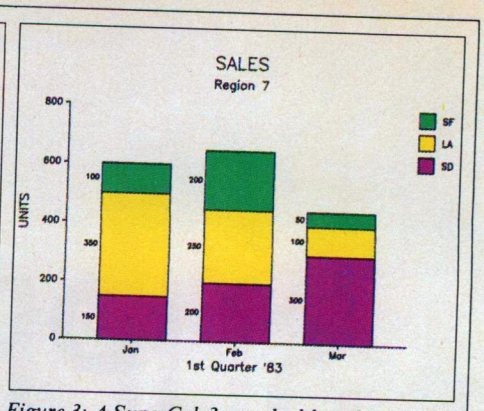


Figure 3: A SuperCalc3a stacked-bar chart. You can also create line, area, high-low, and x-y graphs with the SuperCalc3a program.

sheets (in fact, too many), and I can safely say that SuperCalc3a is all the spreadsheet I will ever need. I am hard-pressed to identify a significant feature or function that I know exists in other products that is lacking in SuperCalc3a.

Once you have all your great information stored, manipulated, and massaged within the spreadsheet, you can view it in one of three ways: First, you can scroll around the screen. Your second choice is to print it out (don't forget Sideways, which makes a lot of impossible reports possible). Your third choice is a graph.

The Graphics

Graphs are wondrous things that let you distill hundreds of pieces of information into one simple picture. SuperCalc3a's graphics ability is impressive. The program can create pie, exploded pie, bar, stacked bar, line, area, high-low, and x-y graphs (see figures 1–3.) It has eight different fonts (figure 4), and the ability to print more than one graph type per page.

Other features include the ability to print labels horizontally or vertically (depending on the best fit), automatic resizing of graphs to fit text, and a veritable army of supported printers and plotters.

You can view a graph on the screen in up to 15 colors and print in up to 99. SuperCalc3a's graphics capability alone would be a very good business-graphics program.

Data Management

The data-management capability of SuperCalc3a is just as good. With easy-to-learn, simple keystrokes you can find, extract, and sort information. Each database can have up to 253 records, with 63 fields per record, each up to 116 characters long.

Sorting is fast because everything is kept in memory. The sorts can use both a primary and secondary key, so if you're looking for the day your cousin Harold leaves the country for a two-year missionary stint, you can ask for Harold, leaves, instead of just Harold, which might return his birthday (which is hopefully after he leaves). Fast, effective, easy to use.

Utilities

The Apple/IBM communications program sends and receives files on the Apple. To manipulate them on the IBM, you need an IBM PC communications program. The simple procedure is well explained in the SuperCalc3a documentation. SuperCalc3a even goes as far as telling you how to wire cables for the transfer. I tried it, and it worked perfectly.

SuperCalc3a has a set of utility programs that convert data-file formats to make information readable by SuperCalc3a, and to convert it into a form (such as the DIF format) that other programs can read. The best part of these utilities is the documentation, which is as easy to read as the program is to run.

Figure 4: Five of the eight user-selectable typestyles available with SuperCalc3a for labeling your charts and graphs

1. Block, single-stroke
abcdefghijklmnopqrstuvwxyz
ABCDEFGHIJKLMNOPQRSTUVWXYZ
!+-*/.,<>;:"[]'=`~\()&^%$_#{}@!?
1234567890

2. Block, double-stroke
abcdefghijklmnopqrstuvwxyz
ABCDEFGHIJKLMNOPQRSTUVWXYZ
!+-*/.,<>;:"[]'=`~\()&^%$_#{}@!?
1234567890

3. Roman, double-stroke
abcdefghijklmnopqrstuvwxyz
ABCDEFGHIJKLMNOPQRSTUVWXYZ
!+-*/.,<>;:"[]'=`~\()&^%$_#{}@!?
1234567890

6. *Italic, triple-stroke*
abcdefghijklmnopqrstuvwxyz
ABCDEFGHIJKLMNOPQRSTUVWXYZ
!+-/.,<>;:"[]'=`~\()&^%$_#{}@!?*
1234567890

8. *Script, double-stroke*
abcdefghijklmnopqrstuvwxyz
ABCDEFGHIJKLMNOPQRSTUVWXYZ
!+-/.,<>;:"[]'=`~\()&^%$_#{}@!?*
1234567890

Strong Performance

OK, so far we have covered at least six additional selling points for SuperCalc3a. Other ones include exceptional documentation, considerable improvements on and enhancements of "standard" spreadsheet features, and a set of Answer cards (quick study guides to help productivity).

If you haven't gathered it by now, I think SuperCalc3a is an exceptional program. It rivals any spreadsheet program, on any computer, anywhere. For serious spreadsheet users, SuperCalc3a puts the Apple IIe and IIc right up there with the IBM PC as business computers.

Sorcim, my hat is off to you. SuperCalc3a demonstrates both consideration of our needs and excellence in design and programming. ✚

Ken Landis has been a consultant since 1978. He has published more than 100 articles on the use of computers as business or personal tools.

▶ PRODUCT INFORMATION

SuperCalc3a
Sorcim/IUS Corporation
2195 Fortune Drive
San Jose, CA 95131
(408) 942-1727
List Price: $195
Requires: Apple IIe or IIc (IIe enhanced with 80-column card); one disk drive; 128K RAM; ProDOS 1.0.1 or higher

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▶SOFTWARE/BY JOHN ECKHOUSE

THE NEWSROOM

DESIGN AND PRINT YOUR OWN PUBLICATIONS WITH YOUR APPLE II

Apple II owners, take heart! We can write and illustrate beautiful-looking newsletters and publications, too. Macintosh machos would have us believe that it takes a Fat Mac and a LaserWriter printer to produce a corporate bulletin or neighborhood newspaper, but don't believe it! Just slip The Newsroom disk into your disk drive and you are on the way to professional-looking publications, complete with crisp graphics.

Although originally conceived as a piece of educational software to help kids in school polish their writing, reading, and art skills, the program really has mass appeal. Not only can you learn some of the basic skills of putting out a newspaper—about the only thing missing is the editor screaming for a story as your deadline nears—but you can also actually produce publications. The Newsroom has communications software built in, so a budding editor can assign stories to reporters and have them send in their manuscripts and artwork via telephone lines.

The program even offers one feature not yet available in most professional newsrooms. The Newsroom enables an editor to lay out each page on-screen. Currently, most newspapers use computers for writing and editing chores but then send the material, along with graphics and photos, to a "backshop" where printers paste up each page of the paper by hand.

Great Fun—Some Limitations

Don't expect The Newsroom to put *The New York Times* out of business, however. Despite the program's power and creativity, it has narrow limits in many areas. The Newsroom's page-layout system is quite primitive, the graphics are limited, and the program requires an annoying constant swapping of disks, for example.

Although the instruction manual is clear, it is still very easy to leave out a photo or even a line of text, as I found out when printing one newspaper. To write, edit, lay out, and print just one page of a newspaper requires that you switch back and forth among six floppy disks. That's tough enough for a circus juggler, let alone a newspaper reporter.

On the whole, however, The Newsroom provides hours of entertaining and educational fun. The 86-page manual includes 30 pages of instruction in how to create a newspaper, conduct an interview, write a story, crop a photo, and lay out an attractive page.

Beginning

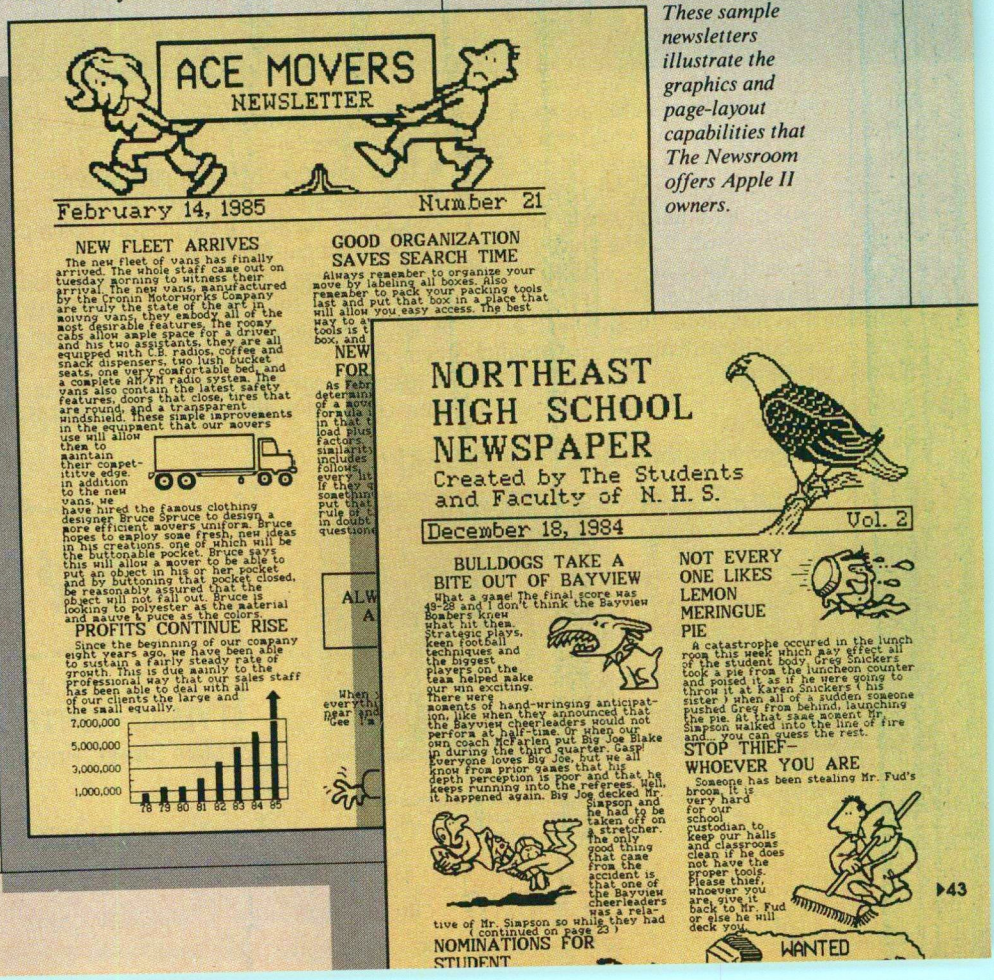
The program comes with two disks, the master and a two-sided disk filled with more than 600 pieces of artwork to illustrate your publications. Before getting to work, however, you need to initialize and set aside four blank data disks for later use in storing stories, illustrations, the newspaper's banner (the title and logo at the top that might say Modoc Monitor), and pages that are completely laid out and ready to go to press. Clearly labeling each disk is a must; otherwise, you may never find the terrific "photo" you selected to illustrate a story.

Booting the master disk, which takes almost a minute and a half, brings up a colorful picture menu of a newsroom. The photo lab is represented by a darkroom, the copydesk by a copy editor reading someone's story, and so on. You select which of the six work areas to move into with either joystick, KoalaPad, or keyboard control.

Name and Logo

Before you write stories, you need to decide on a name for your publication. Then move into the banner area to design the newspaper's logo. You will find eight icons to choose among, such as a picture icon that allows you to pull a piece of artwork from the clip-art files, a garbage-can icon to clear the work area, or a floppy-disk icon to store or retrieve a banner.

For some reason, the joystick is very unsteady when you move between icons or around the work area. It can be tough to get the cursor to rest long enough on one of the icons to make a



These sample newsletters illustrate the graphics and page-layout capabilities that The Newsroom offers Apple II owners.

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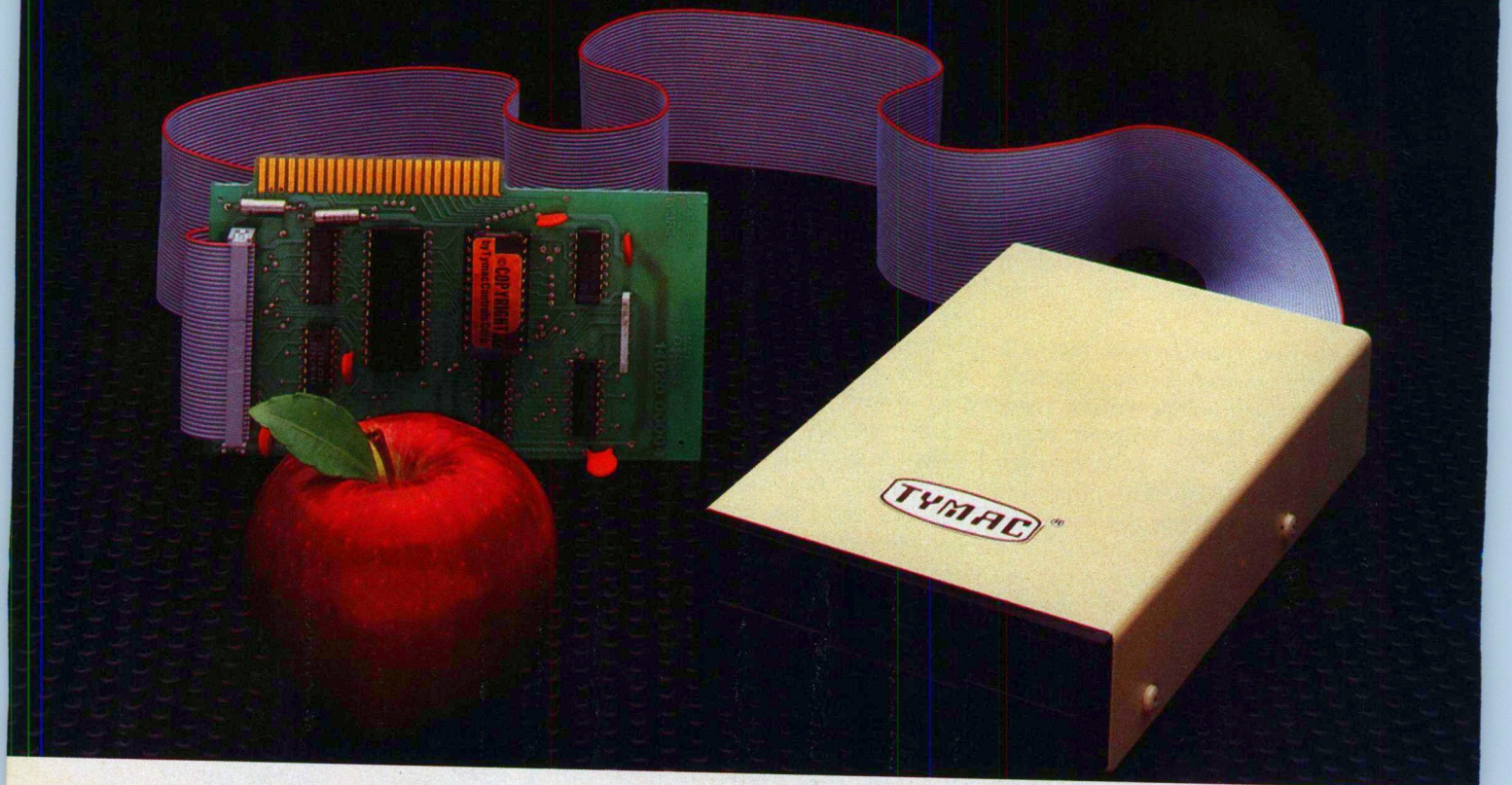

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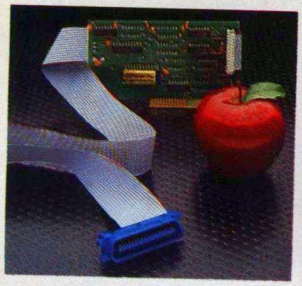

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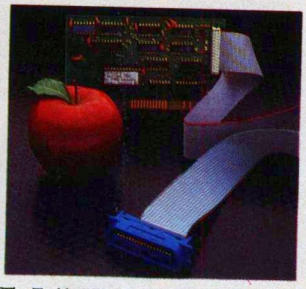

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menu selection. I thought perhaps my joystick was the problem, but I encountered the same response when I switched to the KoalaPad, so I used the keyboard instead.

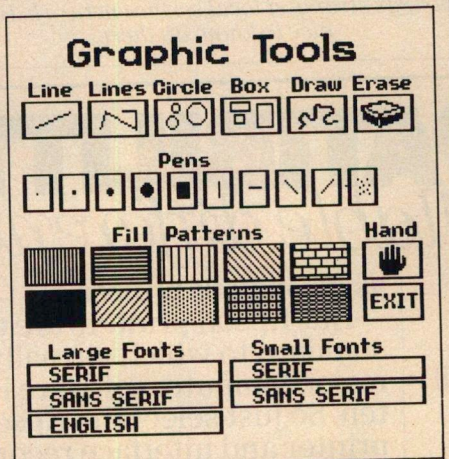
You design a banner by first selecting a graphic image from the files stored on the two-sided clip-art disk supplied with the program. The graphics range from beasts to kids, rodents to workers. One icon enables you to flip the art, so you can have a cat facing either left or right, for example. Graphics tools in the banner area allow you to modify the existing art or create your own. You can select different-size pens for freehand drawing; boxes, circles, or lines; and ten different fill patterns.

After finishing the art, you add text to your logo. The Newsroom gives you a choice of three large fonts—serif, sans serif, and English—or two small fonts—serif and sans serif. When you have completed the banner, you save it to the banner data disk and return to the main menu.

Illustrating a News Story

As a journalist, I generally assign a photographer or artist to illustrate my stories somewhere near the end of the writing process, when I have a firm idea of how the piece will turn out. I quickly learned, however, that when you use The Newsroom, it's best to decide on art first. Dropping a piece of art into a completed story makes you lose part of the written material, which you cannot recover, because you can't move text around as you can with a word-processing program.

You therefore enter the photo lab before you enter the copydesk writing area. Pick a graphic "photo" and then use the joystick, KoalaPad, or keyboard to move it into the proper position on your page. A major drawback is that you, unlike a professional journalist,



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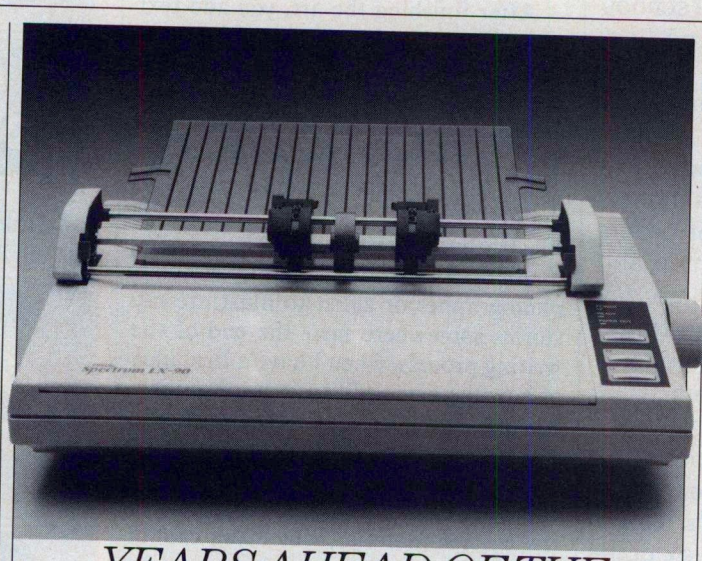

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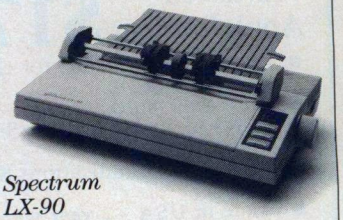

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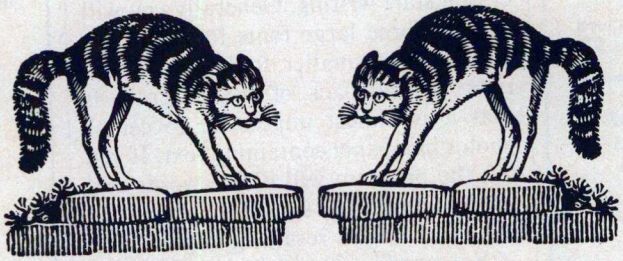

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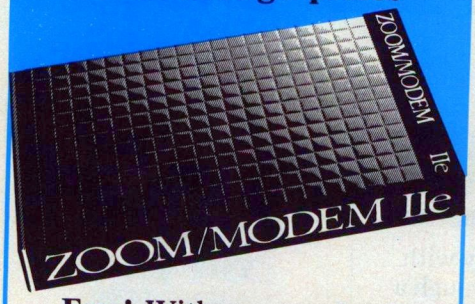

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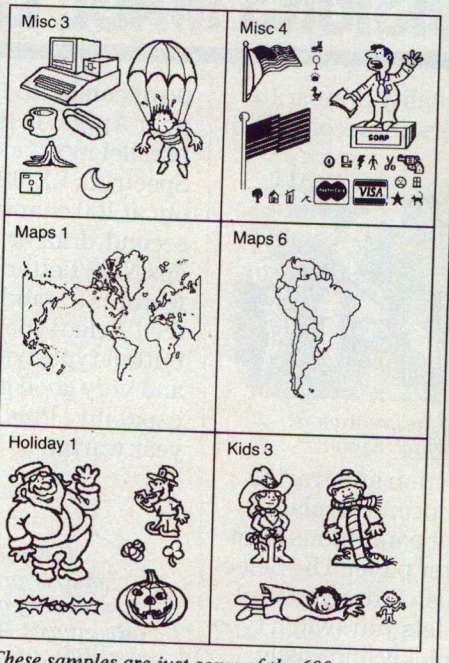
cannot change the size of the photo. You can "crop" the photo—that is, use only a portion—but you cannot scale the entire picture to a more handy size. After picking the photo, placing it on the page, adding a "cutline" (a caption), and cropping the photo, you save it on your photo data disk.

Now you enter the copydesk, retrieve your photo, and place it on the work area. The Newsroom divides a standard 8½ × 11-inch piece of paper either into six work areas (called panels) plus a banner across the top, or into eight panels. You can work with only one panel at a time, and no photo can occupy more than one panel. A story can carry over from one panel to the next, but it won't happen automatically. You have to finish one panel and save it



These samples are just some of the 600 pictures you can select from The Newsroom Clip Art library.

to disk before opening up the next panel. Thus, you need to remember exactly where you left off in midsentence or risk having a non sequitur in your story.

Start Writing

After placing your photo on the panel, you start writing. Generally you will use the three large fonts for headlines and the two smaller fonts for normal type. A drawback of the program is that it is almost impossible to center photos in a panel containing text. If you try, the program will divide words and put half on the left side of the photo and half on the right, resulting in gibberish.

Seasoned writers will not find this word-processing program to be terribly convenient, but it suffices for casual use. The program is always in the In-

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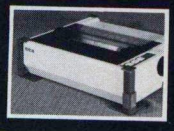

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sert mode; it cannot be turned off. To delete text, you position the cursor over the character you want to eliminate and press the Delete key (Control-D for Apple II Plus users). You cannot move or eliminate blocks of text.

If you are working with colleagues who are at remote locations, you need to enter the wire-service work area to transmit or receive copy. The Newsroom permits Apple, IBM, and Commodore personal computers to communicate with each other and transmit Newsroom files back and forth. For example, you might create a photo on your Apple, send it via modem to a friend who has a Commodore 64 to write the story, and then send it to a third person with an IBM Personal Computer who would use the panel to lay out a page and return it to you for printing.

It's clear that Apple II owners like creative graphics programs. The Newsroom looks like another hit.

Layout—a Lengthy Process

After completing all the panels containing the words and photos you need for your publication, you move to the layout area. Here the program gets complex and slow.

To lay out the proper story for the upper left panel of the page, for example, you first insert the panel-data disk in drive 2 and select from the menu a panel you completed in the copydesk area. You repeat this procedure for all six panels that appear on an 8½ × 11-inch page. To lay out the banner, you must remove the panel-data disk in drive 2, insert the banner-data disk, and select from the menu the banner you completed in the copydesk area.

Now you remove the banner-data disk from drive 2 and insert the page-data disk, on which you will store the selected panels and banner. Next, remove the program master disk from drive 1 and insert the banner-data disk. The program will automatically retrieve and store, on the page-data disk, the banner you previously laid out.

After that you remove the banner-data disk from drive 1 and insert the panel-data disk, so the program can transfer the previously-laid-out panels to the page-data disk in drive 2. Now the program asks you to insert your photo-data disk in drive 1—first, remove the panel-data disk—so it can re-

trieve and store on the page-data disk in drive 2 the photos that accompany your text.

If you inadvertently save a panel on a photo-data disk instead of a panel-data disk, the process takes even longer because you have to search the disk files. This complicated process is The Newsroom's major weakness.

Roll the Presses

OK, now that you finally have everything laid out and stored on disk, it's time to roll the presses!

The Newsroom works with virtually any printer Apple II owners might have. Springboard Software claims the program currently works with more than 1000 printers. The program's printer defaults are set for an Apple Imagewriter printer, but it is easy to change the setup for any other machine, using the joystick, or cursor keys. Then just select which page, panel, banner, or photo you wish to print; press the key; and watch the presses roll.

It took me about three hours to design and print my first 8½ × 11-inch newspaper. It was far from perfect: One panel had a big blank space where I had forgotten to save a photo to disk, and the headlines ran too close to the type. Nevertheless, the program provides a feeling of great accomplishment and pride when you have your creation in hand. Educationally it's commendable, too, for it encourages kids to cooperate and use the computer to work together on a project.

Don't be surprised if your neighborhood association starts using this program to write its monthly newsletter or if you receive a lot of family letters next Christmas written with The Newsroom. Given the huge success of The Print Shop, it's clear that Apple II owners like creative graphics programs. Despite some inherent limitations, The Newsroom looks like another hit. ✚

John Eckhouse is a newspaper reporter in San Francisco who covers high-technology industries and enjoys using his Apple IIe.

▶ PRODUCT INFORMATION

The Newsroom
Springboard Software, Inc.
7807 Creekridge Circle
Minneapolis, MN 55345
(612) 944-3912
List Price: $49.95
Requires: Apple II Plus, IIe, or IIc; one disk drive

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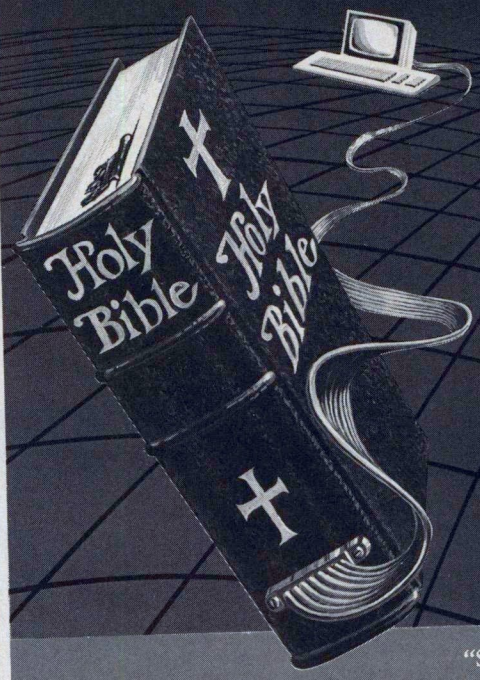

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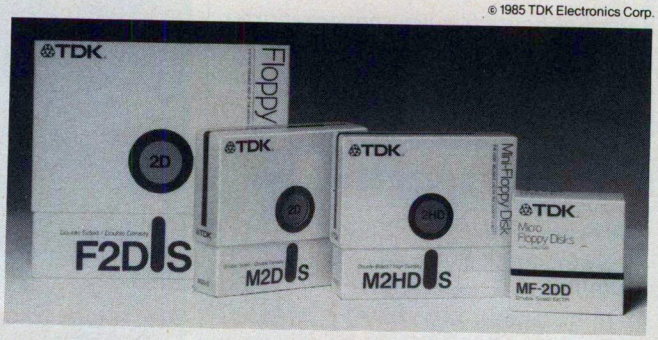

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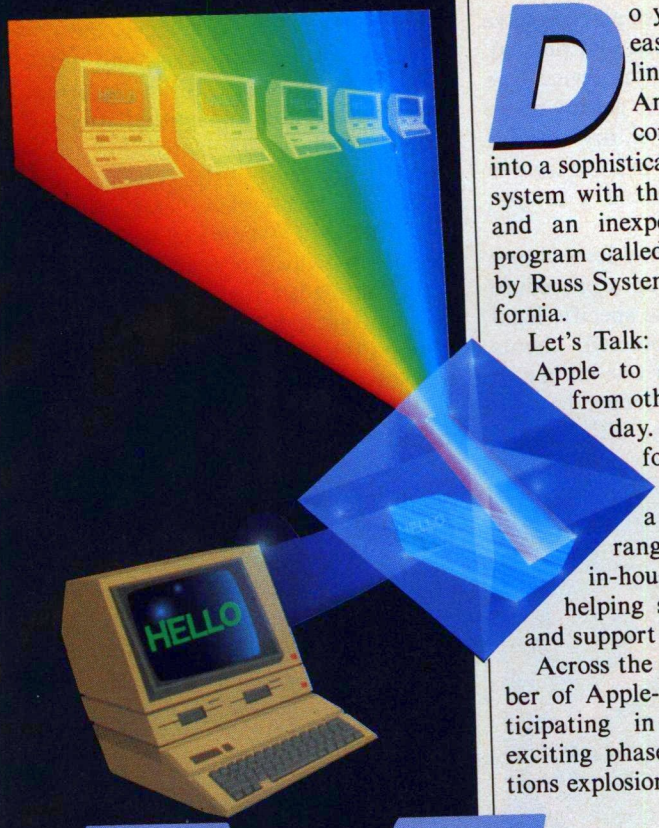

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BY MIKE WENDLAND

'A real bulletin-board service hangs on the wall and presents information to passersby. What we're talking about is an automated information-exchange program.'

Do you know that you can easily create your own on-line interactive database? Any Apple IIe, IIc, or III computer can be turned into a sophisticated on-line information system with the addition of a modem and an inexpensive communications program called Let's Talk: developed by Russ Systems of Santa Cruz, California.

Let's Talk: allows your unattended Apple to answer incoming calls from other computers 24 hours a day. This type of on-line information and messaging system can be used for a multitude of purposes, ranging from providing an in-house messaging system to helping small businesses market and support their products.

Across the country, a growing number of Apple-computer users are participating in the latest and most exciting phase of the telecommunications explosion. They are creating their own highly sophisticated but easy-to-use electronic databases that are both interactive and informative. What BBSs did for the pure hobbyist—who suddenly found kindred spirits anxious to swap computer information and philosophies—messaging systems are doing for the serious business user who wants more than a computerized form of citizens-band radio.

Through these messaging systems, Apple users are tapping new business markets, reducing overhead by letting their computers handle the routine telephone work that employees had been doing, and setting up small-scale on-line information-retrieval services that keep them in touch with customers and salespersons. Furthermore, they're having fun.

A messaging system is perfectly described by its name. If you're familiar with a BBS, you have a pretty good idea of what a messaging system is and how it operates. Messaging systems are much more, however, and their operators bristle when you compare the two.

"We are not a bulletin board," says Steve Russ, developer of Let's Talk:, one of the most sophisticated of the several pieces of new messaging-system software now on the market. "A real bulletin-board service hangs on the wall and presents information to passersby. What we're talking about is an automated information-exchange program, not a hobbyist system. Sure, we could be configured as a bulletin board, but to do so would not take advantage of the program's scope and flexibility."

Today, businesses interested in communicating publicly or privately with their clientele are using most of the messaging-system programs. Other businesses are establishing 24-hour communications networks with their various field offices or salespeople on the road. Still others are putting buyer and seller information on-line, thus communicating around the clock everything from contracts to inventory data.

Computer messaging systems make sense financially, too. Businesses incur most of their operating costs during eight hours each day, five days a week. That's only 25% of the total time available on their computers, however. By installing an extra telephone line and paying about $125 for a messaging-system program, the business can keep going even when business hours are over.

"This is incredibly exciting, a whole new way of doing business," beams the operator of one such system, Scott Carss, an attorney in San Jose, California. "It's so innovative that it's like something you'd read in one of those 'What will the future be like?' stories from the 70s. The future has arrived."

COMPUTER GRAPHIC: JIM RABON/IMAGE ELECTRONIC, INC.

Carss, whose office uses four Apple III computers and a Mac, specializes in computer law, and his clients are mostly software developers in the San Francisco Bay Area. In order to meet a variety of different needs, Carss used Let's Talk: to design his system on three levels. The first level, open to the public, resembles a conventional BBS. It's made up of directories and text files that contain a computer-law newsletter and a section in which callers or Carss can pass along inside information. An example of such a section is Vendor of the Week, where callers can find the best and most inexpensive place to have a program instruction manual printed. "This is sort of my public service," he says, "a place where I can get my name out to potential users of my service. Hopefully, they'll check in from time to time, and, when they need a lawyer, they'll call me."

That's where the second level comes in. Here, Carss has set up a procedure that allows users to raise specific legal questions. Password-protected, clients can "talk" via computer one-on-one to their lawyer. Clients no longer have to wait until Carss is in the office or off the telephone. They can access the system, type in their question, and check in later for an answer. Billing information is on-line and transmitted after the "conversation" is completed.

In the top level of the system, Carss conducts open-ended conversations with his clients. Clients have their own special file, which is password-protected for confidentiality. "If they need specific contract language, I can revise and write on their computer as we confer," says Carss. "Then they've immediately got a copy of the exact legal wording, and so do I."

Other computer professionals are similarly excited about messaging systems. In Mission Viejo, California, software engineer Bill Long set up his Apple with Let's Talk: and uses it as a 24-hour message service. He communicates with a group of program designers he supervises who are scattered across the country, throughout all the time zones. Besides exchanging questions and answers, Long and his developers often put specialized software on-line.

"It's so innovative that it's like something you'd read in one of those 'What will the future be like?' stories."

"This keeps us from reinventing the wheel," he says. "If somebody needs a specific application, chances are they can find it there, instead of writing it themselves or waiting for me to mail it to them."

Long thinks of his messaging system as "an advanced telephone-answering machine" that allows him to lead a normal life without being a slave to the telephone.

The uses for messaging systems are legion. In Jackson, Mississippi, David MaGee, a vice president and economist with the state's largest bank, uses an Apple III to keep customers informed about tax-free investments and the latest interest rates on certificates of deposit. The system he has designed is menu-driven and has the potential of becoming a marketing tool.

"It can count the number of callers and users of a particular function," explains MaGee. "We can ask them for their name and address, and, in return, we give them a password that allows them to check daily quotes on stocks of

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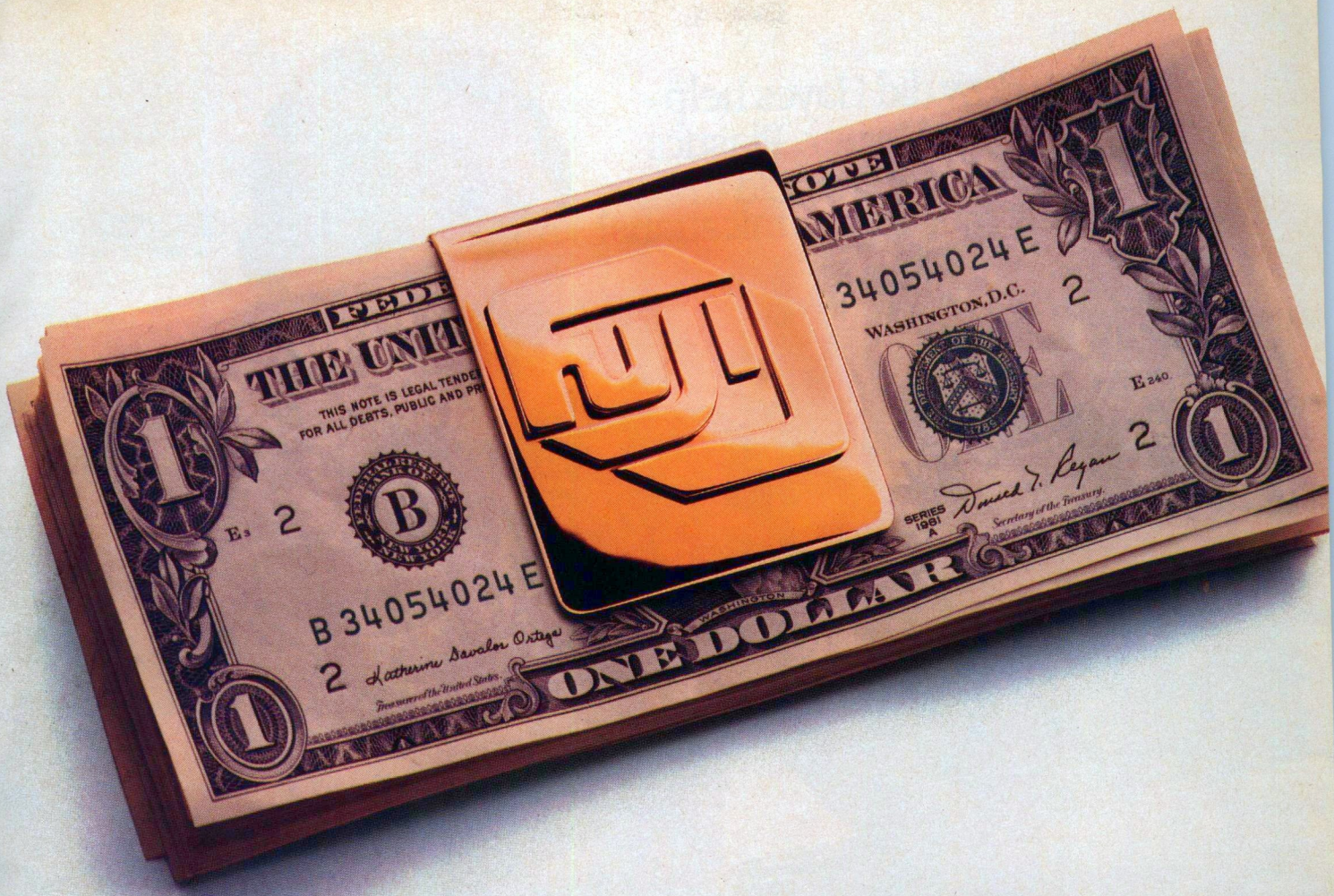

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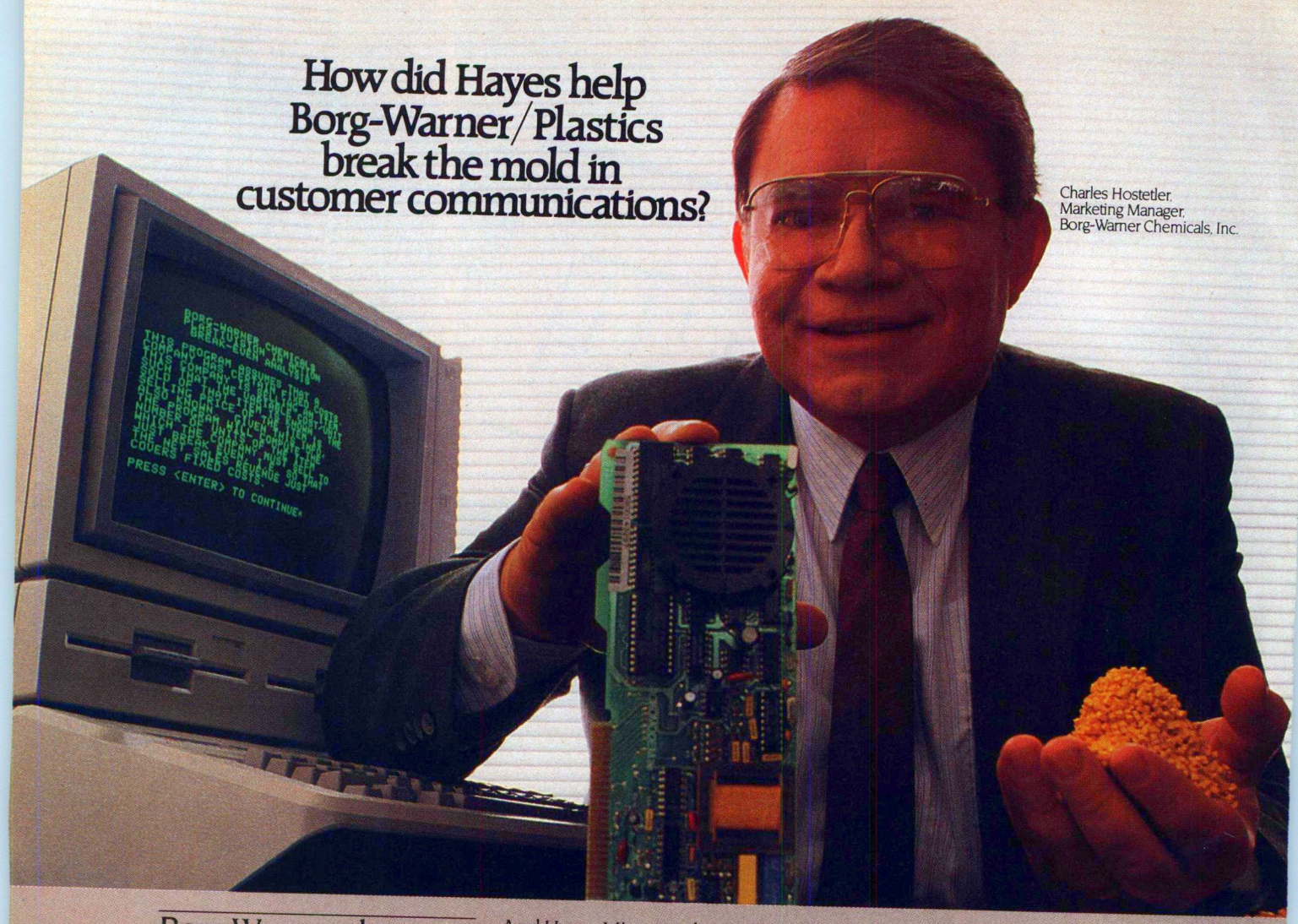

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local interest. That gives us a ready-made prospective-client list."

In Roswell, New Mexico, mortgage broker Jon Hitchcock is setting up a messaging system between dozens of real-estate offices in the Southwest. "There are 50 different mortgage loan plans available, and not only are they all different, but rates also keep changing every day," says Hitchcock, a senior vice president and treasurer of Pioneer Mortgage Company. "Now we've got the flexibility to respond immediately to a request for information. We keep the information on-line around the clock and have our secretaries update it every day."

More Potential Uses

Banks and computer experts aren't the only potential users of a messaging system. Besides the case studies we've already examined, here are some other possibilities:

Technical Support. Many computer stores have found a messaging system to be a handy way to provide answers to the same basic questions many new customers ask. A menu-driven tutorial can easily be set up to help customers get started. For the really hard questions, a system can allow customers to "page" the store's technical staff to come to the computer immediately in order to give the customer more personalized attention.

Working at Home. Perhaps one of the most common uses of telecommunications for serious users is being able to access the office computer from the one at home. With the right software, you can perform almost any function at home that the office machine can perform.

Advertising and Sales. Special sales, promotions, and inventories can be put on-line, offering up-to-the-minute information. Customers can place orders electronically.

Teleconferencing. This is one of telecommunications' latest trends. A messaging system handles numerous computer "conversations" at once, giving managers a way to consult from different locations, and business associates a way to brainstorm an idea or project.

Hobby Use. Interested in stamp collecting? Running? Rare books? Setting up a messaging system devoted just to your area of interest allows like-minded persons a chance to swap ideas on the latest issue, a marathon training schedule, or a first-edition find.

A Solid Future

Messaging-system programs are appropriate in a variety of business settings. They have evolved from bulletin-board services that only hackers used. Today this type of telecommunications software fills a wide range of business needs, from electronic-mail services, to teleconferencing, to on-line technical support. Messaging systems are sure to play an increasing role in business in the years to come. ✚

Mike Wendland is an investigative reporter and free-lance writer in Detroit, Michigan. He specializes in computer and electronic subjects and is a contributor to numerous magazines.

▸ PRODUCT INFORMATION

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THE PEN plotters

Do you have visions of pie charts, bar charts, and flashy transparencies? Are you looking for a low-cost plotter to put your computer-aided-design (CAD) drawings on paper? If you are looking only for a machine to draw Logo creations on paper, look no further. In this article we review eight affordable plotters in order of their increasing price: Penman, Epson HI-80, Houston Instrument (HI) PC595 and PC695, Apple Plotter 410, Gould Colorwriter 6120, Sweet-P Model (SP600), and Hewlett-Packard (HP) 7475A.

What Can They Do?

As you might guess, plotters allow you to draw circles, lines, curves, and even characters. Each plotter we looked at has commands for altering the size, slant, and orientation of the text. Some of the plotters offer advanced commands that draw pie wedges, do cross-hatching, or even draw a continuous curve to a set of points. You may never need to know the programming commands, though, if you plan to use a plotter only with commercial software programs. Some graphics packages, such as Macplot by Microspot or KeyChart by SoftKey, are compatible with almost all of the plotters we've looked at here. In fact, we used KeyChart to run each plotter (except the Penman) through a simple bar chart (see figure 1). For more business-graphics considerations, see "Presentations with Personality" in the February 1985 issue of *A+*, pages 26–33. If you are considering CAD applications, you will be happy to know that almost all of these plotters work with both 8½ × 11-inch and 11 × 17-inch paper. For more information on CAD considerations, see "Let Your Apple Do the Drafting," *A+*, December 1984, pages 29–47.

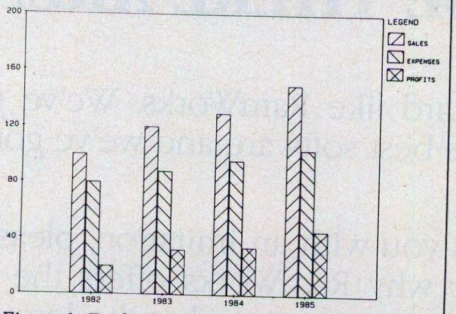

Figure 1: Each plotter (except the Penman) drew this test bar chart using KeyChart, from Softkey. Our Comparison Chart near the end of this article lists the results.

Plotter output looks sharpest on smooth-finish paper, and the pens containing water-base ink that you usually receive with the plotter work fine. For transparencies, however, you need to order pens with oil-base ink from the manufacturer.

Almost all of these plotters (except the Penman) draw by moving the paper in one direction while moving the pens in the other. These machines are typically more compact and less expensive than plotters that provide their own drawing surface. Similarly, the lower-priced plotters ($400 – $800) normally draw in three or four pen colors, and the higher-priced plotters ($1000 and more) offer six or more colors.

A few of the plotters (Epson, Hewlett-Packard) feature automatic pen-capping capability. This feature helps users avoid the dreaded "dry pen disease," and none of us likes to get our fingers dirty capping the pens by hand. Fortunately for Macintosh and Apple IIc users, all of these plotters are available with at least an RS-232C serial interface, although not all of them offer it as a standard feature. Epson is the one manufacturer that seems to prefer the parallel interface as standard, with serial as an option.

Penman

If you're fascinated with robots and robotics (as we are), the Penman plotter should pique your interest. This plotter consists of a robot connected by cable to a stationary box. The robot moves around, drawing with one of its three pens under commands sent to it through the cable. The robot and con-

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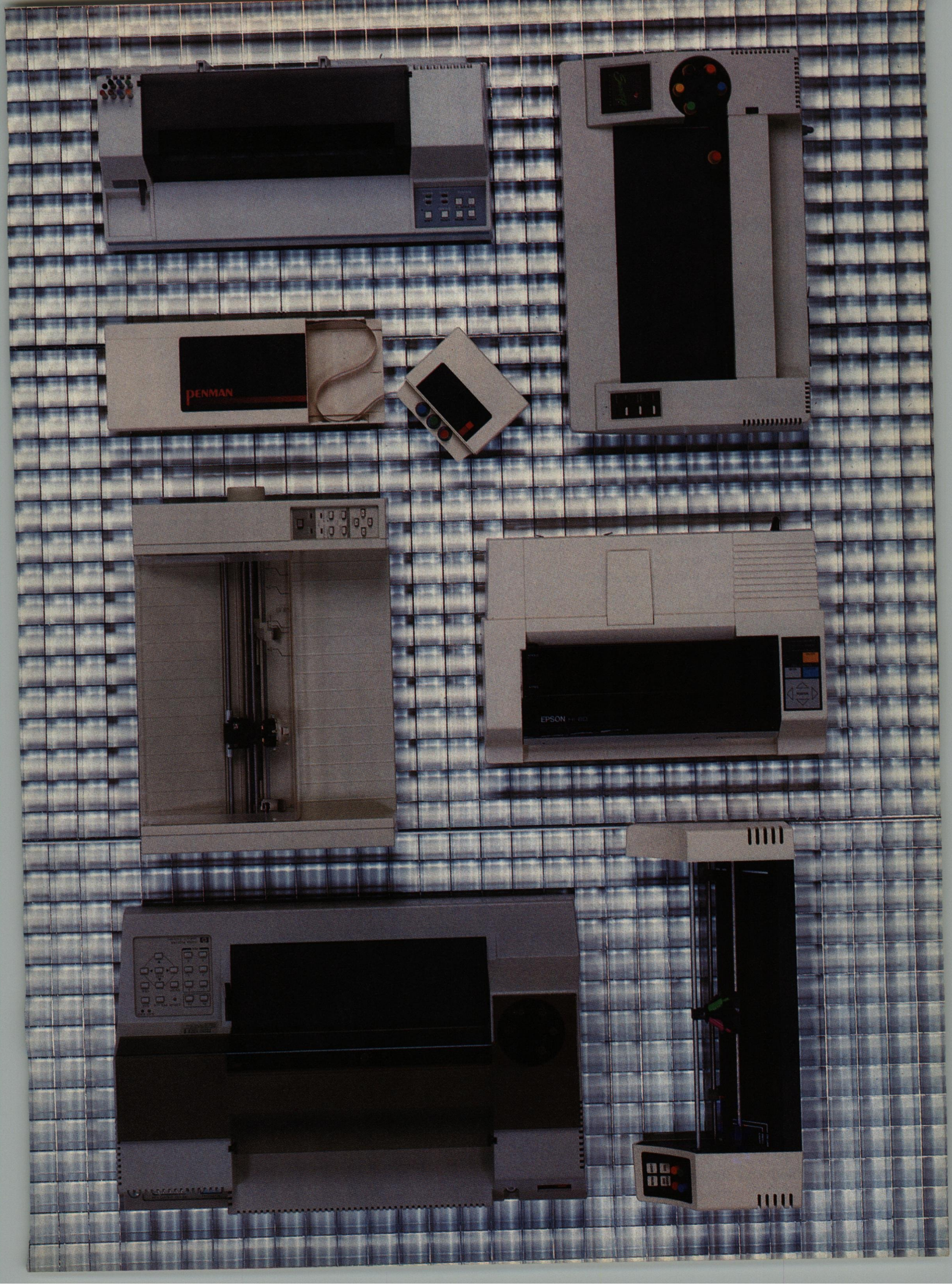
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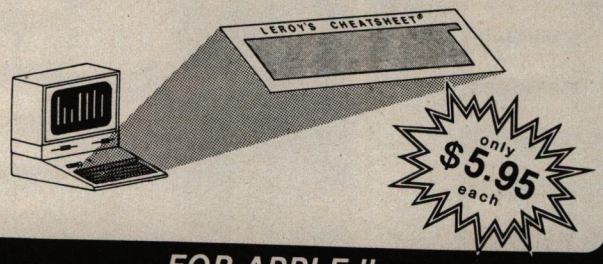

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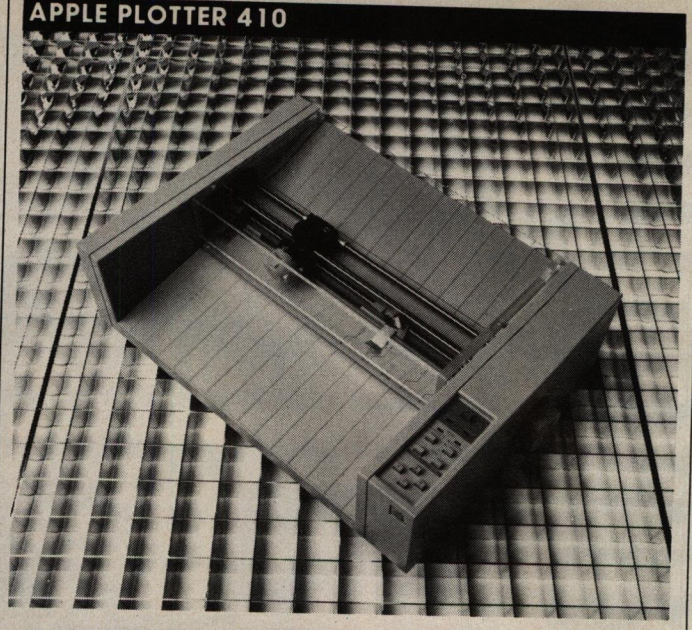

EPSON HI-80

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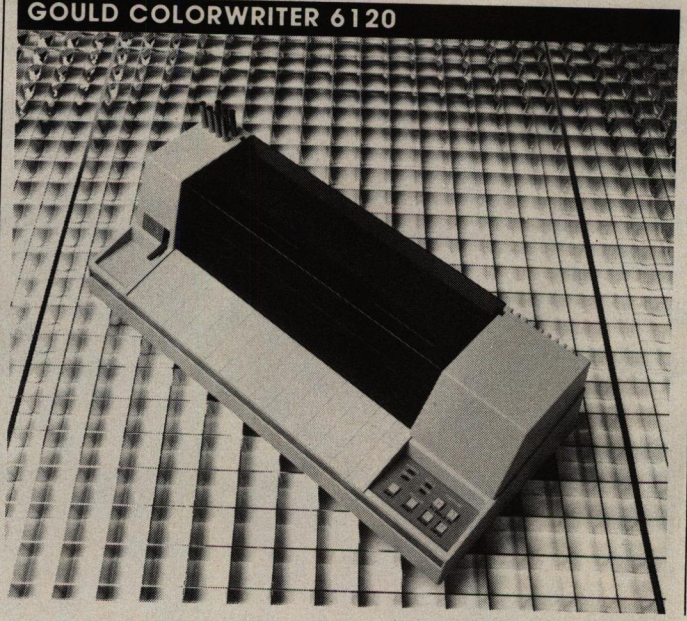

trol box snap together when you want to put the robot to bed, making the whole thing the size of an Apple IIe keyboard. Talk about portable! You can hide it in your desk drawer, no problem!

With this playmate, you must have a flat surface for the robot to draw on. The robot orients itself by recognizing the contrast of the paper's edge against the background. Therefore, you need either a dark tabletop or large, dark mat to put behind the paper you wish to draw on. We used a piece of black construction paper.

The Penman is sure to prove popular in the home and education markets since the commands are easy to learn and use and the robot is fun to watch. The robot is also a perfect three-dimensional "turtle" for use with Logo. Although few programs are compatible with the Penman right now (Logo and Macplot are compatible), we predict that more programs will appear as the marketplace discovers this plotter. With proper software, you can even use the Penman as you would a mouse or a limited digitizer. The concise users' manual helps you get started quickly.

The Penman plotter requires heavy, smooth-finish paper to draw on, since lighter paper allows a "ripple" to get between the wheels of the robot, which reduces significantly the drawing accuracy. Depending on the drawing surface, you may also need to tape the paper down. Although the Penman is one of the slowest plotters, the lines and curves the robot draws are incredibly smooth. The Penman is also exceptionally quiet compared to other plotters, and it supports almost any paper size. We rate this plotter as one of the most exciting around, considering its myriad of uses and its price, which includes software and interface cable.

Epson HI-80

Epson has done it again. Like that company's printers, the Epson HI-80 plotter is a compact and state-of-the-art machine that is moderately priced. This plotter is smaller than most dot-matrix printers (including Epson's), yet it can print accurate drawings in four colors and offers excellent speed. Epson's typically lucid and well-organized users' manual makes setting up the plotter a 10 – 15 minute task.

The quality of the plots we made using the HI-80 was impressive. Drawing our sample bar graph in less than 2 minutes, the Epson was the fastest plotter we looked at. The plotter also offers some advanced commands to simplify programming. For those of you who are not programmers, more and more software packages are becoming available, such as Macplot by Microspot and KeyChart by SoftKey.

One feature of the HI-80 that we really liked is its Printer Emulation mode. Through software or front-panel control, the HI-80 emulates an Epson RX-80. It can print out 80-column text at about six characters per second. You can even do underlining, italics, superscripts, and subscripts, as well as change the print width and height. Naturally, you won't want to print out long documents at this speed, but for short memos it can be handy. The text quality approaches the near-letter-quality text of many dot-matrix printers (see "Dot-Matrix Printers," *A+*, August 1985, pages 26–36).

This plotter's drawbacks include the following: it tends to be fairly loud (it sounds like a typewriter) even with the cover closed; the maximum paper size is limited to 8½ × 11 inches; and the roller mechanism that moves the paper leaves tiny impressions in the sides of the paper. The Epson HI-80 comes with

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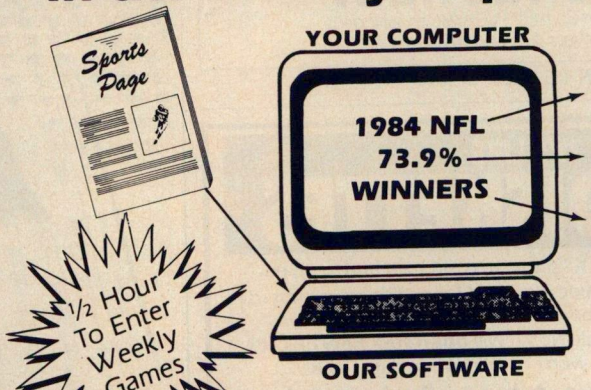

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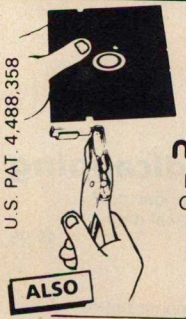

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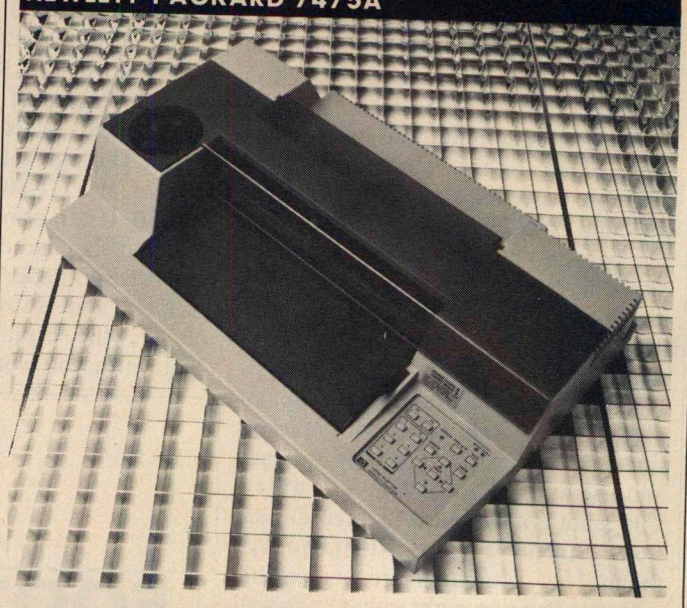

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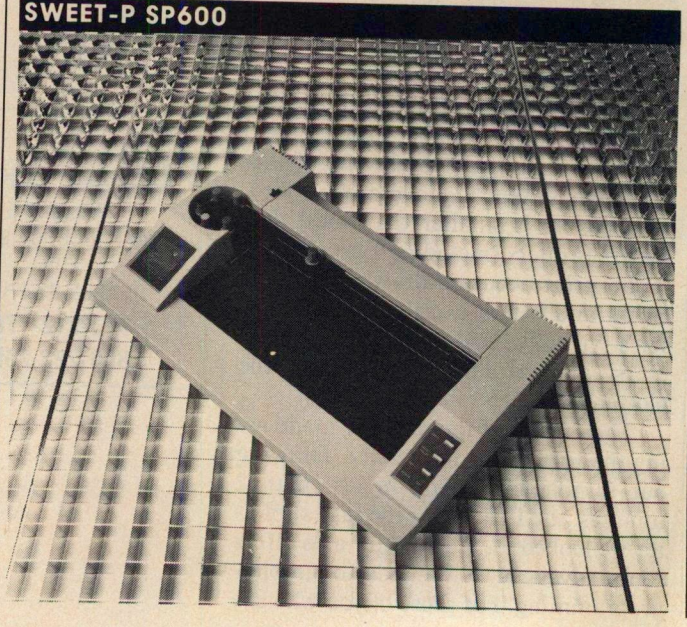
SWEET-P SP600



a standard parallel card and cable for use with Apple II, II Plus, and IIe computers. Apple IIc and Macintosh owners can purchase the HI-80 with a serial interface and cable.

Houston Instrument PC595/PC695

The PC595 uses 8½ × 11-inch paper, and the larger PC695 accommodates 8½ × 11-inch and 11 × 17-inch paper. Houston Instrument (HI) is by no means a new name in plotters, having been in the higher-priced plotter market for a long time. The PC595 and PC695 use the same firmware language as HI's more expensive plotters do and therefore make use of a large, installed base of software.

The HI plotters have some flexible commands available if you need to use the plotters for a custom application. There's even a way to digitize some points manually, which would be useful if you wanted to reproduce a curve.

We were surprised at how light and portable the HI plotters are. All four pens are held in a round plotter head that goes to the side when rotating a new color into place. With this arrangement, you need to be careful to put the pens in securely so they won't fall out during operation.

The HI plotters produce plots that are adequate and readable, but not particularly vivid. On a speed test with our sample bar graph, the HI PC695 came in at 3.5 minutes—a respectable, but not overwhelming, speed. Also, the manual seems more suitable for technicians or engineers than for average users. Since the plug on the back of the plotter is a modular phone plug, you can expect to pay your dealer a little more to wire up an RS-232C cable for you, with the phone plug on the end.

Nevertheless, the HI plotters are well worth looking into when you consider the software available to support them. The PC695 is probably one of the best buys in its price range for CAD applications; it supports a larger paper size and can utilize a large base of CAD software.

Apple Plotter 410

The Apple Plotter 410 is a nice general-purpose plotter that's simple to use. The commands are easy to remember, and the plotter supports both 8½ × 11-inch and 11 × 17-inch paper. You can take advantage of at least 16 popular graphics packages for the Apple II family, including Apple Business Graphics and KeyChart by SoftKey. On the Macintosh, the amount of available software for the Apple plotter is far less; Tekalike by Mesa Graphics, ExperTelligence's ExperLogo, and Macplot by Microspot are three Macintosh software packages for the Apple Plotter 410. If you don't want to use a computer at all, you can draw "freehand" using the plotter's front-panel buttons. Drawing a circle in this way, however, is at least as hard as on a toy Etch-a-Sketch.

Besides being easy to use, the Apple Plotter has precise control over its pens and paper. You have to look closely at the circles it draws to see any hint of jaggedness. The plots we drew had bright, solid colors and strong, easy-to-read lines. The plotter is also fairly quiet and less distracting than most others. A handy pen-capper is included that allows you to cap all four pens at once. On the down side, however, the Apple Plotter was one of the slowest plotters we tested. The plotter took more than 4 minutes to draw our test sample. It was also more expensive than our survey's comparable plotters.

Gould Colorwriter 6120

Gould's Colorwriter 6120 is another space-saving plotter that moves the pa-

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per as well as the pens. Talk about pens! With this plotter, you can use seven pens at once. The Colorwriter 6120 also offers a Printer Emulation mode, supports paper sizes up to 11 × 17 inches, and can be driven by the famous HP-GL (Hewlett-Packard Graphics Language) that's available on most graphics software.

Another useful feature of this plotter is that it comes standard with both an RS-232C serial interface and a Centronics-compatible parallel interface. Although we were able to get both to work, we were able to get the plotter to emulate a printer (using AppleWriter) with the serial port only. Of course, we couldn't resist pulling out the old stopwatch, and we observed a slow 4.5 characters per second for two paragraphs of text—too slow for long documents.

Programmers will appreciate some special commands for drawing bars, pie wedges, and pie charts; specifying hatching; specifying the length of tick marks or dashes; rotating a drawing's coordinate system; and even determining how much space is left in the buffer. The rest of us can enjoy this plotter's speed. The Colorwriter 6120 zipped through our sample bar graph in 2 minutes and 30 seconds. On the other hand, it was one of the louder ones we tested. Still, if you can afford it, this plotter has some good things to offer.

Sweet-P Model (SP600)

The Sweet-P 600 is also known as the Sweet-P Six-Shooter because of its revolving six-pen chamber and its fast draw. This plotter, like the HP 7475A, uses an "arm" that removes one pen at a time from a rotating pen carousel and then returns the pen when the drawing is finished. The pen carousel is removable and automatically caps pens when not in use, preventing the pen tips from drying out.

The front panel has a Pause/Resume key that allows you to stop the plotting, replace pens or carousels, and then resume plotting without damage to your drawing.

The Sweet-P comes with both the RS-232C serial interface and the Centronics parallel interface. The plotter also incorporates the Enter Computer SP-GL graphics language and HP-GL (Hewlett-Packard Graphics Language) specifically for the HP 7470A and HP 7475A. Not only can you easily connect your computer to the plotter, but you can also control the plotter with most commercial software.

The manual is lean, simple, and straightforward. For those of you who wish to write your own software, the manual has only a table of commands for each of the graphics languages. Additional assistance is available from Enter Computer's customer-service staff; call the 800 telephone number listed in the manual for help with software, hardware, and interface questions.

The Sweet-P took only 2 minutes and 15 seconds to draw the test sample. At its price, this plotter offers a good value for a six-pen plotter.

HP 7475A

Probably the Cadillac among plotters is the HP 7475A (six pens), which follows in the footsteps of its popular sibling, the 7470A (two pens). Needless to say, the HP 7475A can use the large number of graphics programs that are compatible with the older HP 7470A. Even though the 7475A offers 10 new software commands, it shares about 40 HP-GL commands with the 7470A.

Unlike the other plotters we reviewed, the HP 7475A uses an "arm"

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Ad Number 222—Page 1

"All the News That Fits"

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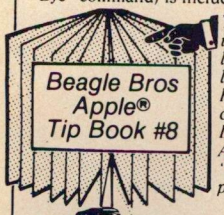
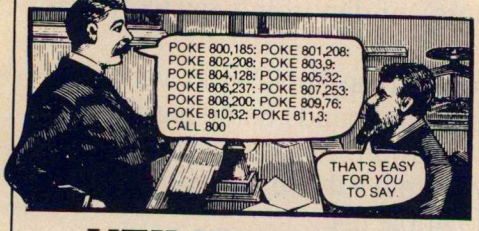


You get a GOLD MINE of tips, including: How to use memory like an extra disk drive (ProDOS lets you load & save files in RAM), How to disable the LIST command so it says "File Locked", How to disable or swap ANY command, How to change "Startup" to any name, How to personalize ProDOS catalogs...



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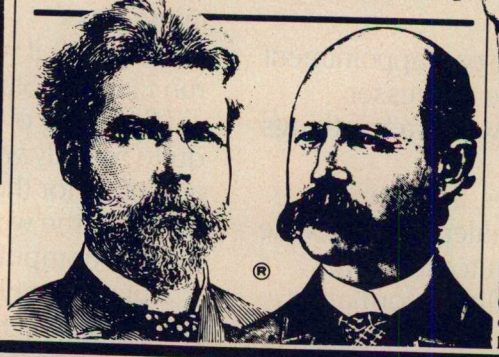

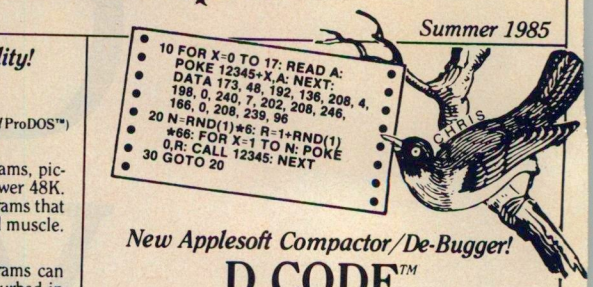

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```
1  HOME: HTAB 5: POKE
   33,28: FOR C=1 TO 92:
   POKE 50,255-192*
   (C=4 OR C=64)
9  J=J+1-31*(J=31):
   PRINT CHR$(9+(J=1));
   SPC(2+(J<10))J;:
   NEXT: PRINT
85 POKE 33,1: PRINT
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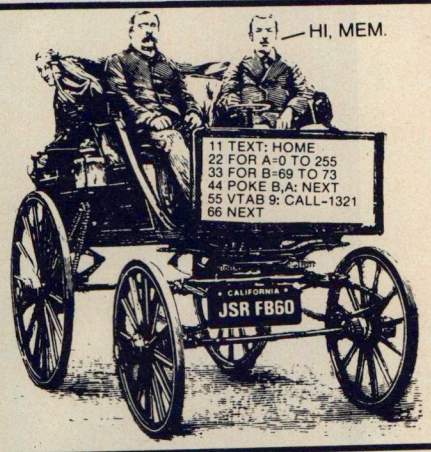

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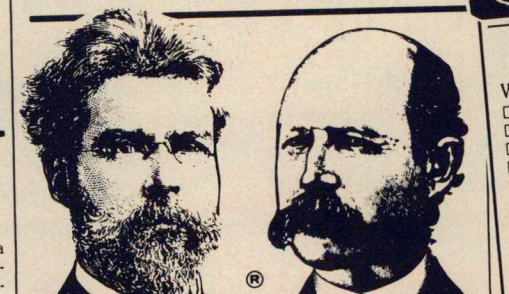

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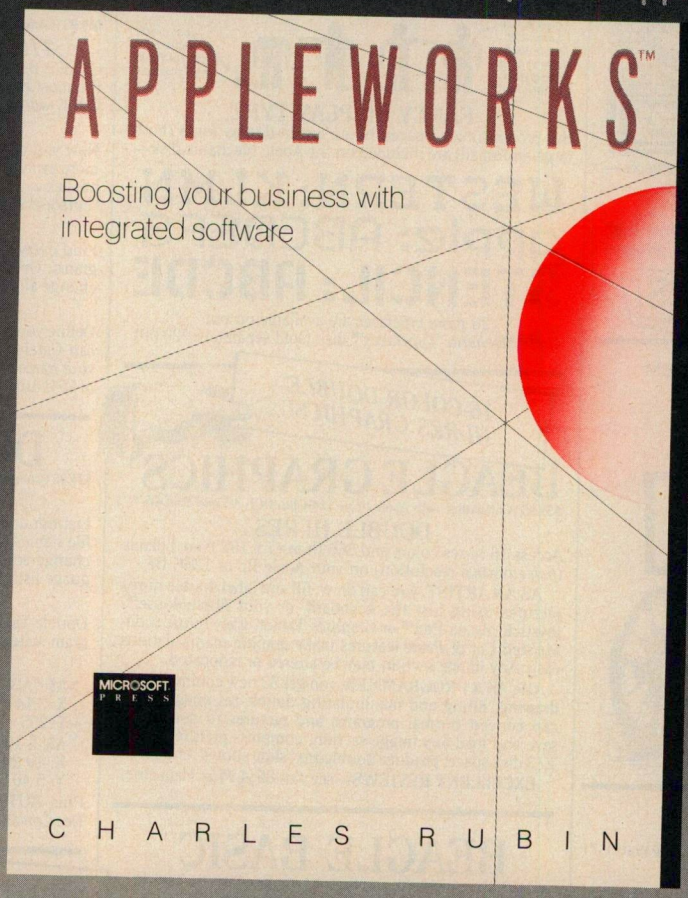

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that removes one pen at a time from a rotating pen carousel and then returns the pen when the drawing is finished. The carousel also keeps the pens capped. Since the entire pen carousel is removable, it's easy to slip in a new six pack of pens. Thus, you might have several carousels for different purposes (such as one for CAD, one for transparencies, and so on).

Another handy feature of this plotter is the manual control feature. Most plotters that offer manual control of pen movement have only one pen speed, which is usually too fast to draw anything but straight lines. In contrast, the 7475A offers two speeds. Using the slower speed (default), we were almost able to draw a decent-looking circle. True, it was jagged, but it was far from the disasters we ended up with when we used other plotters. Also, from the front panel, you can rotate your graphic 90 degrees, stop the plotter in the middle of a drawing to view it (then resume the drawing where it left off), change paper sizes, digitize points on a graph, and change the scale of a drawing to be printed.

One aspect of the 7475A that surprised us was its size. Although not overly large, it is less portable than one might expect of a plotter that moves the paper while drawing. Another minor disappointment is that, when connected, the RS-232C plug points up rather than to the side, causing the cable to stick up a bit and possibly get in the way of larger-size paper as it moves during printing.

Not surprisingly, the HP 7475A cruised through our sample bar graph in only 2 minutes and 18 seconds. The resolution at 0.001 inch and lack of excessive noise was also impressive. We want to commend the documentation, which, in usual H-P style, is very complete and helpful. In fact, the programming manual is literally a book. This plotter has many more features than we had time or article space to delve into. In spite of its hefty price, the HP 7475A deserves serious consideration for applications demanding the performance of a sophisticated machine.

The Bottom Line?

If you've been following our series on printers, you've already heard our suggestions about what to consider when purchasing this kind of accessory for

PLOTTER COMPARISON CHART

MANUFACTURER	Apple	Epson	Gould	Hewlett-Packard	Houston Instrument	Houston Instrument	Penman	Sweet-P
MODEL	Plotter 410	HI-80	Color-writer 6120	7475A	PC595	PC695	Penman	SP600
PRICE	$779	$599	$995	$1895	$595	$695	$450	$1095
NUMBER OF PENS	4	4	7	6	4	4	3	6
MAXIMUM PAPER SIZE (inches)	11 × 17	8½ × 11	11 × 17	11 × 17	8½ × 11	11 × 17	Any Size	11 × 17
RESOLUTION (movements measured in hundredths of an inch)	0.004	0.004	0.002	0.001	0.005	0.005	0.004	0.004
DRAWING AREA (inches)	10 × 15.4	7.5 × 10.5	10.5 × 15	10 × 16.3	7 × 9.5	9.5 × 15.5	24 × 24	7.8 × 10.2
MAXIMUM DRAWING SPEED (inches per second)	3.94	9	7.8	15	3	3	2	14
TIME TAKEN TO TO DRAW FIGURE 1 (minutes:seconds)	4:40	1:49	2:30	2:18	3:30	3:30	Not Available	2:15

your Apple. For those of you who missed our other reviews (shame, shame), here's a recap of our words of wisdom:

- Match the plotter's capabilities (including maximum paper size, pen count, and front-panel control) with your application.
- Consider the available software you want to use.
- Determine which plotters are compatible with your Apple interface.
- Decide on how much you want to spend on a plotter.
- Have your dealer show that it works with your computer and software.
- Remember to consider interface cards, cables, and so on when comparing prices.

We hope these suggestions will guide you to the best plotter for you. ✚

Francesca Venning-Townsley, a writer/instructional designer, has written about computer products since 1982. David Townsley is a product engineer in the semiconductor industry and a frequent contributor to A+.

▶ PRODUCT INFORMATION

Apple Plotter 410
Apple Computer, Inc.
20525 Mariani Avenue
Cupertino, CA 95014
(408) 996-1010
List Price: $779
CIRCLE 358 ON READER SERVICE CARD

Colorwriter 6120
Gould, Inc.
Marketing Services
Recording Systems Division
3631 Perkins Avenue
Cleveland, OH 44114
(216) 361-3315
List Price: $995
CIRCLE 359 ON READER SERVICE CARD

Epson HI-80
Epson America, Inc.
Computer Products Division
2780 Lomita Blvd.
Torrance, CA 90505
(800) 421-5426;
in CA (213) 539-9140
List Price: $600
CIRCLE 360 ON READER SERVICE CARD

HI PC595 and PC695
Houston Instrument
8500 Cameron Road
Austin, TX 78753, or
P.O. Box 15720
Austin, TX 78761
(512) 835-0900
List Price: PC595, $595; PC695, $695
CIRCLE 361 ON READER SERVICE CARD

HP 7475A
Hewlett-Packard Company
Inquiries Manager
1820 Embarcadero Road
Palo Alto, CA 94303
(415) 857-1501
List Price: $1895
CIRCLE 362 ON READER SERVICE CARD

Penman
Penman Products Corporation
705 North Bowser
Richardson, TX 75081
(214) 238-1815
List Price: $450
CIRCLE 363 ON READER SERVICE CARD

Sweet-P Model (SP600)
Enter Computer, Inc.
6867 Nancy Ridge Drive
San Diego, CA 92121
(619) 450-0601
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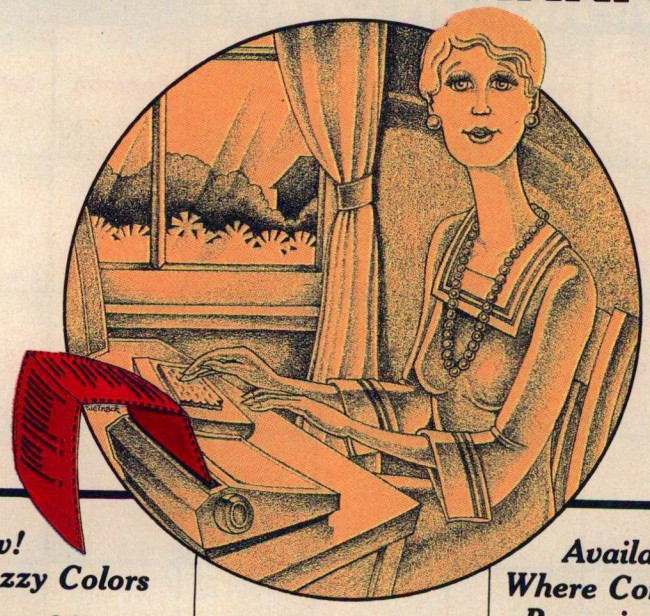

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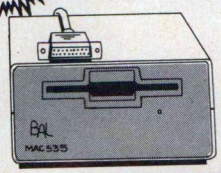

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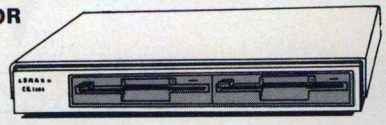

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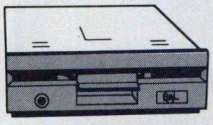

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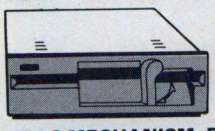

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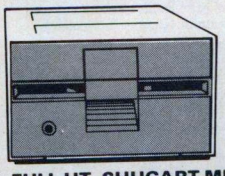

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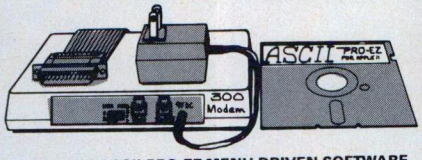

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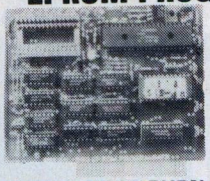

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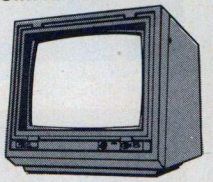

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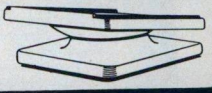

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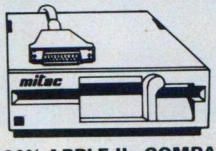

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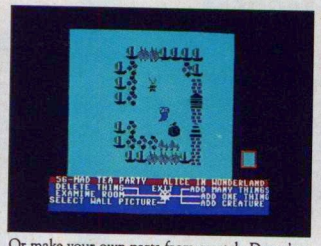

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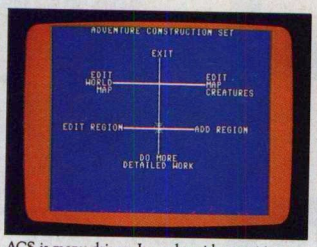

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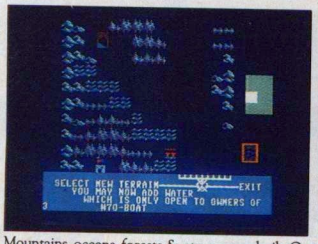
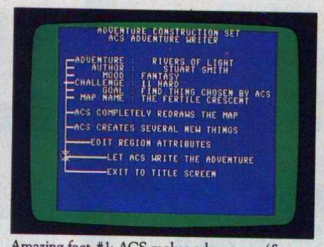
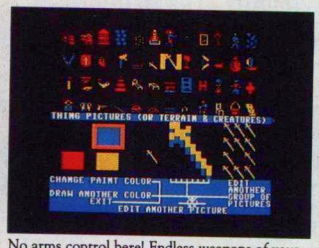


Mountains, oceans, forests & etc. are pre-built. Or make your own landscapes. You're the boss!

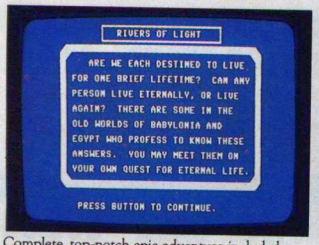


Amazing fact #1: ACS makes adventures (& finishes parts of yours) by itself. This is No Lie!

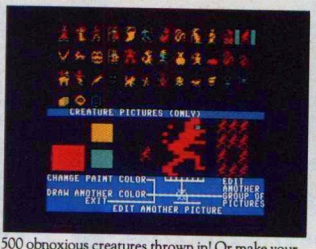
Music modules & sound effects included. Score your adventures like movies. Be a maestro!



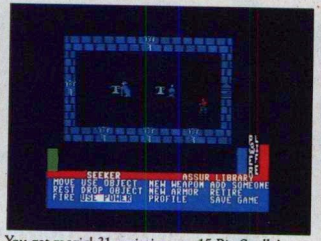
No arms control here! Endless weapons of your design. (Endless armor & cures, fortunately.)



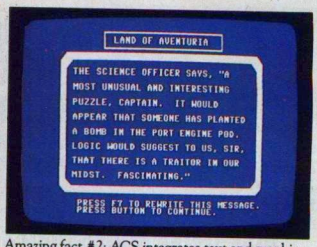
Complete, top-notch epic adventure included: *Rivers of Light* by Stuart Smith, author of *Ali Baba!*



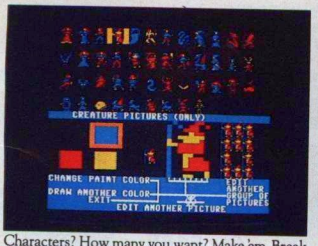
500 obnoxious creatures thrown in! Or make your own. Point 'em at the population! See their priorities!



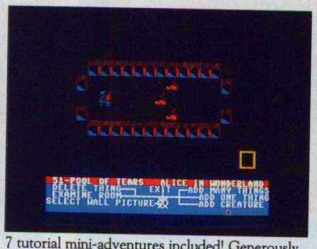
You get magic! 31 variations on 15 Big Spells! You get technology. You get religion. All right!



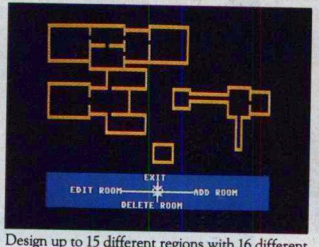
Amazing fact #2: ACS integrates text and graphics. All other products wimp out in this regard.



Characters? How many you want? Make 'em. Break 'em. Cast them into the world without a dime!



7 tutorial mini-adventures included! Generously survivable for those tentative first timers!



Design up to 15 different regions with 16 different rooms in each one. Space out!

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CIRCLE 202 ON READER SERVICE CARD

UNDERSTANDING ProDOS

PART FIVE OF OUR TUTORIAL SERIES ON THIS NEW OPERATING SYSTEM PROGRAM FOR THE APPLE II FAMILY. IN THIS FINAL INSTALLMENT WE INVESTIGATE CONVERT, A UTILITY PROGRAM FOR TRANSFERRING PROGRAMS AND FILES FROM DOS 3.3-FORMATTED DISKS TO ProDOS-FORMATTED DISKS, AND LOOK AT ProDOS MACHINE-LANGUAGE INTERFACE.

This month we're going to complete our series of ProDOS tutorials by investigating CONVERT, a useful utility program on the ProDOS User's Disk. We'll then take a brief glance at the ProDOS MLI (machine-language interface) commands that assembly-language programmers can use to deal with disk files.

CONVERT

You use the CONVERT program to transfer programs and files from DOS 3.3-formatted disks to ProDOS-formatted disks, or vice versa, so that you can use them in the other operating system. You need to do this conversion because the two disk-operating systems use incompatible techniques for storing and keeping track of files on a disk.

You can use CONVERT to transfer any type of file except a random-access text file. (A random-access text file contains data that is organized in fixed-length records rather than in one continuous sequence of bytes.)

The only way you can transfer a random-access text file is to change it into a sequential text file, transfer the new file using CONVERT, and then change it back into a random-access text file. Unfortunately, to change a text file in this fashion, you must know the file's record length (this may be difficult to determine for a DOS 3.3 text file unless you created it) *and* you must find a program that can make the changes for you. (The only suitable program I've seen is listed in Ken Kashmarek's article "Converting Random Files to ProDOS," which appeared in the April 1984 issue of *Call-A.P.P.L.E.*)

Note that even if you transfer a file successfully using CONVERT, you still may not be able to use it if it is a program file. Why? Because the DOS 3.3 ProDOS programming environments are sufficiently different that many programs may not run properly on both operating systems. This is especially true of assembly-language programs that perform disk operations. You can convert and use data files without problems, however.

To start up the CONVERT program, you enter -CONVERT from the Applesoft Direct mode. The program's Command menu looks like this:

R – REVERSE DIRECTION OF TRANSFER
C – CHANGE DOS 3.3 SLOT AND DRIVE
D – SET PRODOS DATE
P – SET PRODOS PREFIX
T – TRANSFER (OR LIST) FILES

To select a command, you press the character to the left of the command name. Three lines at the top of the screen above the Command menu indicate the direction of transfer, the current date, and the active ProDOS prefix.

REVERSE DIRECTION OF TRANSFER

When CONVERT first begins, it indicates the direction of transfer by displaying a phrase on the second line of the screen. The phase

```
DOS 3.3 S6,D2 ---> ProDOS
```

for example, means that the program will transfer files from a DOS 3.3 disk in slot 6, drive 2 to a ProDOS disk. In order to reverse the direction of transfer, you press R to select the REVERSE DIRECTION OF TRANSFER command. When you do this, the transfer phrase will change to

```
ProDOS ---> DOS 3.3 S6,D2
```

You can, of course, press R to reverse the direction of transfer once again.

CHANGE DOS 3.3 SLOT AND DRIVE

This command allows you to enter the slot and drive number of the DOS 3.3 disk that is to participate in the transfer operation. The transfer phrase at the top of the screen indicates the current numbers.

SET PRODOS DATE

When CONVERT first begins, it displays the current date (if available) near the top of the screen. The program assigns this date to every DOS 3.3 file that it transfers to a ProDOS disk, and this date also appears when you catalog the disk.

If you want to change this date, you can press D to select the SET PRODOS DATE command. CONVERT expects you to enter dates in the form DD-MMM-YY, where DD represents the day of the month, MMM represents the first three characters in the name of the month, and YY represents the last two digits of the year. You would enter September 21, 1985, as 21-SEP-85, for example. (Note that you don't have to

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enter the hyphens because CONVERT automatically enters them for you.) If you enter an erroneous date, the program displays the message

```
Error: Invalid Date
```

and ignores the entry.

SET PRODOS PREFIX

This command allows you to specify the prefix that CONVERT will use to create a full pathname when you use the TRANSFER (OR LIST) FILES command to specify any filenames or partial pathnames. When you press P to select the SET PRODOS PREFIX command, CONVERT asks you if you want to specify the prefix by pathname or by slot and drive.

If you specify "by pathname," you must enter a ProDOS prefix in the standard way. If you specify "by slot and drive," you need only specify the slot and drive number of the ProDOS disk. CONVERT automatically determines its volume directory name and uses it as the prefix.

TRANSFER (OR LIST) FILES

Once you have specified the direction of transfer, the ProDOS prefix, and the slot and drive number of the DOS 3.3 disk, you can press T to begin a file transfer. If you are transferring files to a ProDOS disk, the program asks you

```
What DOS 3.3 file(s)?
```

or, if you are transferring them to a DOS 3.3 disk, it asks

```
What ProDOS file(s)?
```

Now you can enter the name of the file you want to transfer, with or without a = or ? wild-card character. (You use wild cards in exactly the same way as you do when you use the FILER program, which I discussed last month; that is, the program treats as a group all files whose names begin with the characters before the wild card and end with the characters after it.) If you don't use a wild-card character, or if you use a =, CONVERT locates the group of files you want to transfer and transfers them immediately.

If you specify a name with a ? wild card (or just press Return), the program displays a complete list of filenames on the source disk that match the wild-card name. To select a particular file, you use the arrow keys to move the inverse bar cursor over the file's name and press the space bar; an arrow then appears to the left of the name. To undo a file selection, you can press the space bar again and the arrow disappears. Once you have finished selecting the group of files you want to transfer, press the Return key to start the transfer.

Note that if you are transferring files from a DOS 3.3 disk to a ProDOS

Command Name	Command Code	Description of Command
ALLOC_INTERRUPT	$40	Install an interrupt-handling subroutine
DEALLOC_INTERRUPT	$41	Remove an interrupt-handling subroutine
QUIT	$65	Transfer control to another system (SYS) program
READ_BLOCK	$80	Read a data block from the disk
WRITE_BLOCK	$81	Write a data block to the disk
GET_TIME	$82	Read the current date and time
CREATE	$C0	Create a new file
DESTROY	$C1	Destroy an existing file or directory
RENAME	$C2	Rename a file
SET_FILE_INFO	$C3	Modify the directory entry for a file
GET_FILE_INFO	$C4	Read the directory entry for a file
ON_LINE	$C5	Determine the name of the volume directory for an installed disk
SET_PREFIX	$C6	Set the pathname prefix
GET_PREFIX	$C7	Read the pathname prefix
OPEN	$C8	Open a file for input/output operations
NEWLINE	$C9	Specify the character that will terminate a file read operation
READ	$CA	Read data from a file
WRITE	$CB	Write data to a file
CLOSE	$CC	Close a file
FLUSH	$CD	Flush a file buffer
SET_MARK	$CE	Set the value of the MARK (position-in-file) pointer
GET_MARK	$CF	Get the value of the MARK (position-in-file) pointer
SET_EOF	$D0	Set the value of the EOF (end-of-file) pointer
GET_EOF	$D1	Get the value of the EOF (end-of-file) pointer
SET_BUF	$D2	Change the position of a file buffer
GET_BUF	$D3	Get the position of a file buffer

Figure 1: The ProDOS MLI commands

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```
                JSR $BF00           ; Call the MLI
                DFB CMDNUM          ; MLI command code
                DA  PARMTBL         ; Address of parameter table
                BCS ERROR           ; Carry is set if error occurred
                RTS
PARMTBL         DFB NPARMS          ; Number of parms in table
                ,
                [the rest of the parameters are placed here in the
                 order defined by the MLI command. ]
```

Figure 2: A typical subroutine for invoking an MLI command

disk, the names of some files may change because DOS 3.3 has less stringent naming rules than ProDOS does. CONVERT will display the new names it has assigned to these files as it transfers them.

If you are transferring a file that already exists on the destination disk, you see the message

```
Error: File already exists
Replace existing file? (Y/N)
```

If you want to continue with the transfer, press Y and CONVERT will overwrite the existing file.

THE MACHINE LANGUAGE INTERFACE (MLI)

Unlike DOS 3.3, ProDOS contains a carefully designed, low-level command interface—called the Machine Language Interface or MLI—that you can use to perform fundamental disk operations from within 6502 assembly-language programs. The MLI comprises 26 commands, each identified by a symbolic name and a unique command code. Figure 1 gives brief descriptions of these commands.

You invoke every MLI command in the same general way. Figure 2 illustrates a typical subroutine. The key instruction here is JSR $BF00, where $BF00 is the address of the entry point to the ProDOS MLI interpreter. The interpreter determines which MLI command you have requested and then passes control to the appropriate ProDOS subroutine, which handles the request.

To determine which command you have requested, the MLI examines the value stored in the byte immediately following the JSR $BF00 instruction. This byte contains the unique command code (see Figure 1) associated with the MLI command you have requested.

The two bytes following the command code contain the address (low-order byte first) of a parameter table that the MLI command uses. Such a table begins with a byte that contains the number of parameters in the table; the rest of the table holds data that the MLI command requires to process your request. After the computer has executed the command, the table will also hold any resulting data.

The software gurus at Apple Computer have carefully defined the structures of the parameter tables for the MLI commands. You can refer to my recent book *Apple ProDOS: Advanced Features for Programmers* or Apple's *ProDOS Technical Reference Manual* for detailed descriptions.

After an MLI command finishes, control passes to the instruction immediately following the two bytes that hold the address of the parameter table (BCS ERROR in the example shown in Figure 2). If an error has occurred, the 6502 carry flag will be set, the zero flag will be clear, and a nonzero error code

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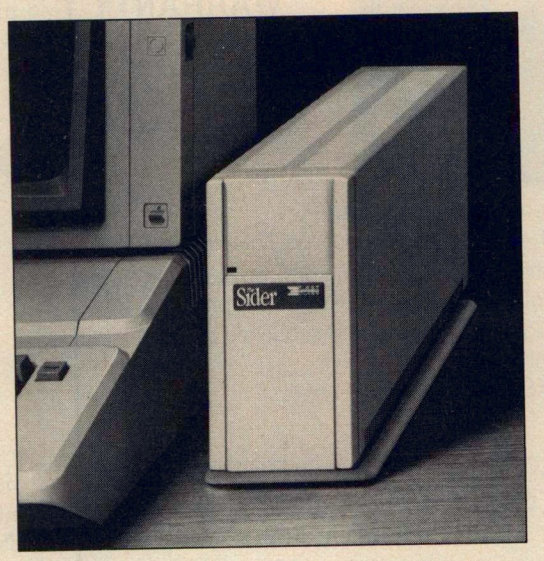

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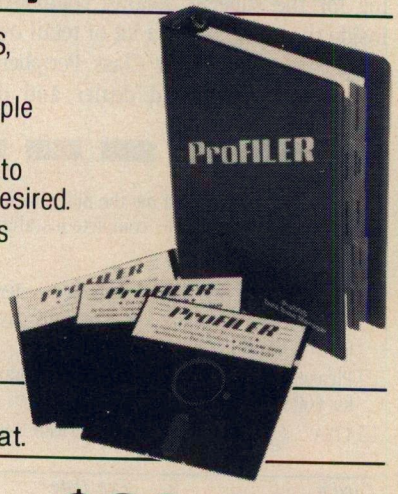

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will be in the accumulator. This means that you can use a BCS (branch on carry set) or BNE (branch on not equal to zero) instruction to branch to the error-handling portion of your code. If all went well, the carry flag will be clear, the zero flag will be set, and the accumulator will be zero.

You should note that virtually all programs that perform disk operations ultimately make use of the ProDOS MLI commands, even though you may not be aware of it. When you use the BASIC.SYSTEM LOAD command to transfer an Applesoft program from disk to memory, for example, you are taking advantage of GET_FILE_INFO, OPEN, GET_EOF, READ, and CLOSE.

You should now be an expert on how to use pathnames, subdirectories, and the two major system utilities—FILER and CONVERT.

It works something like this: When BASIC.SYSTEM sees that you've entered the LOAD command, it calls GET_FILE_INFO to see if the file exists. It then calls OPEN as a prelude to transferring the file from disk by calling READ. Finally, it uses the MLI CLOSE command to release the file buffer area that is associated with an open file. Of course, you don't have to worry about setting up MLI parameter tables or even knowing what MLI commands to use because the BASIC.SYSTEM does this for you automatically.

Well, we've finally finished! In the course of this five-part series, we have covered most of the important aspects of ProDOS and BASIC.SYSTEM, its Applesoft interface. You should now be an expert on how to use pathnames, subdirectories, and the two major system utilities—FILER and CONVERT. If you need more help, I suggest you read one or more of the recently published books about ProDOS. Good luck! +

Gary B. Little is a writer from Vancouver, British Columbia. His latest book is a detailed study of the internal structure of ProDOS: Apple ProDOS, Advanced Features for Programmers *(1985, Brady Communications). He is also the author of the Modem Magician telecommunications program.*

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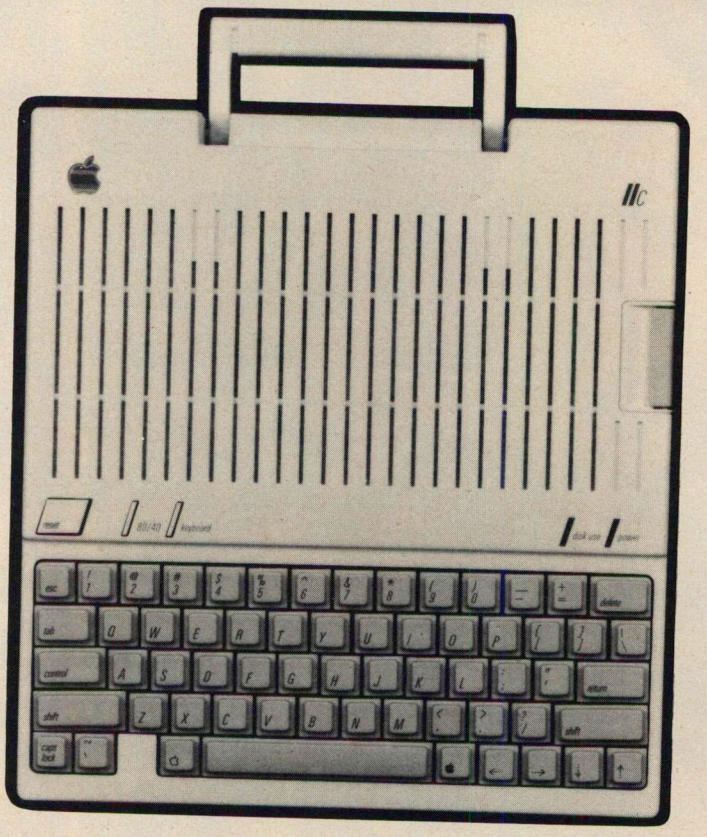

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The fourth and final part of our tutorial on using the language of the LaserWriter printer

The Medium

POSTSCRIPT

And The Message

The PostScript language included in every Apple LaserWriter printer permits us to write our own programs for creating text and graphics output, but its real purpose is to support store-bought applications. In this fourth and last part of our PostScript tutorial, we'll concentrate on PostScript's role as a supporting agent for higher-quality program output.

The bulk of PostScript applications have yet to be written. PostScript, developed by Adobe Systems of Palo Alto, California, has been available for only slightly more than one year. (Apple announced the availability of the LaserWriter last March.) The first PostScript book, written for Addison-Wesley by Adobe, saw completion early this summer.

As a result, early PostScript activity has centered largely on efforts by Adobe, Apple, and a few quick-moving independent firms to make large numbers of existing applications compatible with PostScript and the LaserWriter. A few firms with graphics-arts software already have PostScript projects underway, and Microsoft, with its strategic connections to both Macintosh and IBM PC developments, has included PostScript in one version of Microsoft Word.

The Macintosh was already designed, announced, and out on the market when Apple formed an alliance with Adobe. Consequently, PostScript compatibility has not been, until recently, a Macintosh design goal—Macintosh software standards don't call for output using PostScript; instead, programs are expected to work with Macintosh QuickDraw.

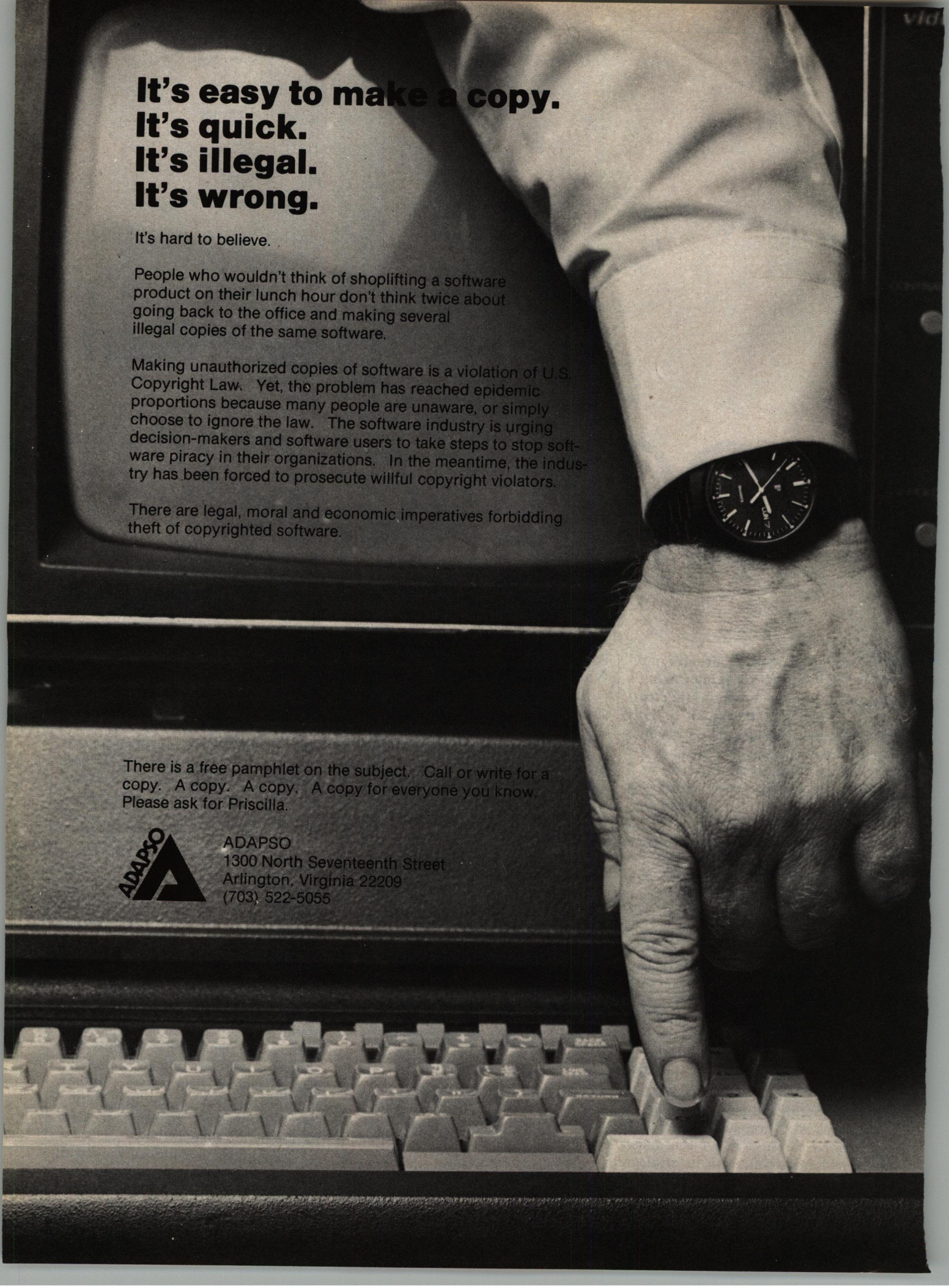
PostScript permits us to write our own programs for text and graphics output, but its real purpose is to support store-bought applications such as those described here.

QuickDraw

QuickDraw is the graphics package built into the Macintosh operating system (actually, mostly in the ROM permanent memory) that translates program requests into the boxes, shapes, characters, and patterns you see on the screen. Conceptually, it functions somewhat like PostScript, changing higher-level descriptions of what ought to be drawn into the actual bit patterns displayed on the screen. Both of Apple's own programs and almost all programs from independent developers use the QuickDraw routines.

Furthermore, QuickDraw is also used for the normal Macintosh Imagewriter output. Using QuickDraw, programs set up a printer image area in memory and then write to that area just as if they were writing to the screen. The Macintosh then passes the data from that region to the Imagewriter software driver, which formats the data for use by the Imagewriter.

One reasons to build software with this kind of common resource is to facilitate updates and changes. In theory,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you should be able to change a few operating-system pointer tables, which get loaded in from your disk each session, to point to PostScript routines instead of QuickDraw routines. The programs wouldn't notice the difference, but the output would be ready to run on a LaserWriter (or any other PostScript-speaking device).

Unfortunately, in practice it turns out to be slightly more complex. Like most Macintosh system software, the QuickDraw interface resembles Pascal procedures. But PostScript is a threaded language that takes a very different approach based on processing stacks of commands. Making a change between them would resemble switching between languages that not only had different vocabularies, but also different grammars—and even different implicit world views.

Apple's solution has been to leave the QuickDraw interface alone at the program side but to intercept the internal procedures for translation into PostScript. In this way, programs can keep their current interfaces, only one version of the QuickDraw ROM is needed, and all the customization is done in the two system files (Laser Prep and LaserWriter Initialization) that come with the LaserWriter.

Thus, for most programs—from Apple or any company —you don't have to worry about PostScript at all. Once you run Laser Prep, all the conversion occurs automatically.

If you're really sharp-eyed, you may notice that graphics drawn with this method are a bit undersize (by about 4%), because QuickDraw is based on integer arithmetic and the 72-dots-per-inch screen resolution of the Mac. Because 72 doesn't divide evenly into 300 dots per inch, the LaserWriter uses a slightly smaller maximum-dot packing to create images. Similarly, if you get out a good stopwatch, you may notice some slight slowing of output. These slight imperfections are worth tolerating, since they are part of a solution that allows a whole existing body of software to run with this new output technology.

If you're looking for clues on future Apple products, note that although both PostScript and QuickDraw include software support for color, Apple says it saw no immediate reason to include that support in the conversion programs—bad news for those of us who were hoping for a color Mac in the near future.

PageMaker

Aldus Corporation, producer of the PageMaker page-layout software, chose not to use the QuickDraw adapter routines in favor of its own PostScript driver. According to Aldus' John Nelson, higher performance and better device independence were the two major factors that tipped the scale in favor of a direct PostScript driver.

On the LaserWriter, going directly to PostScript allows PageMaker to use the full 300 dots per inch. In addition, it means that the Aldus software package is also able to drive true typesetting machines with even higher resolution, such as the Allied Linotronic 101 and 300 (discussed below).

Fortunately, Nelson says, PostScript facilitated the task of making PageMaker more powerful and versatile. "I don't see how it could be done without PostScript," he reports. "It's a real treat working with the language."

Although adding PostScript required extra effort on Aldus' part, it won't take much extra effort for users—the one necessary step is to run the AldusPrep program in place of Laser Prep when you set up your disks to print to the LaserWriter.

PageMaker is one of the more impressive products in a whole slew of electronic publishing products emerging for the Macintosh and the LaserWriter. Many firms in the higher end of the computer typesetting business view the LaserWriter and other PostScript output devices as desirable printers by themselves. Again, making a route between existing standards and PostScript has inspired the first completed efforts.

TeX

In Michigan, TextSet (a typesetting consulting firm not associated with the typesetting-equipment firm Texet), has written a TeX-to-PostScript converter. Like the QuickDraw-to-PostScript converter produced by Apple, the TeX-to-PostScript program allows existing software that produces TeX format output to drive the LaserWriter. Although the TextSet software runs only on minicomputers and higher-end workstations, another company, Kellerman & Smith, is working on a similar product for the Macintosh, called Macintosh TeX.

TeX, by the way, is pronounced *tek*. It is a typesetting language written by Stanford mathematician Donald Knuth to facilitate more attractive

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typesetting of scientific and mathematical journals. TeX has gained an extensive following in universities and research establishments and a smaller but growing group of users in industry.

TranScript

Adobe offers a similar product called TranScript that goes from the troff files produced by UNIX systems to PostScript. With an even larger user base in universities than TeX has, and certainly many more in industry (including a large number of users at AT&T, the originator of UNIX), troff and other UNIX output languages represent a major potential market for the LaserWriter.

MacBridge Card

Even IBM PC users, whether or not they like the Macintosh, seem to be scrambling to hook up to the LaserWriter. One company, Tangent Technologies, has released a plug-in card for the IBM PC that hooks that machine up to AppleTalk. One attraction for many users, says Tangent's Vice President of R&D Tom Divine, is that the $595 MacBridge card includes software to convert WordStar output files to the PostScript files needed to drive the LaserWriter.

Along with straight conversions with the CONVWS command, the MacBridge software supports an added set of dot commands (WordStar's formatting commands) to control the LaserWriter, and a LaserGraph program to create charts that you can print directly or include in WordStar documents. Conversion also works on plain text files, such as those produced by assemblers and compilers.

Word

Anything WordStar can do, Word can do better, seems to be the view from Microsoft, so it's no surprise that it has added a PostScript-based LaserWriter driver to the set supplied with the PC version of its word-processing package. Even with this new driver, Word on the PC may not be as flexible as Word on the Macintosh, but the output for ordinary text certainly looks attractive. Interestingly enough, Microsoft doesn't have immediate plans for a direct PostScript driver for the Macintosh version of Word—that product will continue to use the QuickDraw conversion method.

GEM

Even Digital Research's GEM environment, which aims in part to offer PC owners some of what they miss out on by not having Macintoshes, wants to hook up to the LaserWriter. One of GEM's main features is its use of a virtual device interface (a standard interface that doesn't depend on specific hardware) along with a set of drivers for specific output devices. One of the devices that Digital Research is supporting is the Apple LaserWriter, using PostScript as the method of communication.

Linotronic 101 and 300

Finally, the LaserWriter output may be good, but it's not really any closer to true typeset quality than most near-letter-quality printers are to producing fully formed letters. In both cases, the print quality is impressive on the lower-performance machines, considering their speed and price, but, if you look closely, you'll still see the dots. For applications where you really need true typesetting, you can turn to Allied Linotype's Linotronic 101 and 300.

Admittedly, these machines are not what your average small-business work group needs for everyday use—and with prices between $20,000 and $50,000, not everyone can afford one. But for in-plant printing, typesetting houses, quick-print shops, and forms

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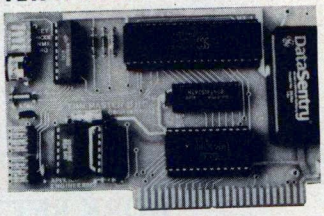

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suppliers, this machine represents a reasonable investment. Resolution ranges up to 2500 dots per inch for the 300 and up to about 1500 dots per inch for the 101, which represents a major jump over the LaserWriter's maximum resolution of 300 dots per inch. Typically, these machines are used for producing single originals on RC paper (the special resin-coated paper used for layout and pasteup) or for imaging paper printing plates. A LaserWriter, used in tandem with a typesetting machine, can serve as a lower-cost proofing station.

Linotype has been producing these machines with its own, non-PostScript interfaces and typesetting language, so PostScript won't be the only alternative. According to Steve Byers, Allied Linotype's Director of Typography, the firm has high expectations for units with the added PostScript processing board.

Apple, by the way, sees the Linotype machines as complementary rather than competitive. Knowing that you can upgrade to higher-resolution output should encourage sales of LaserWriters, and, even on direct sales of the Linotype units, Apple is still hoping that you'll drive them with a Macintosh.

Most Powerful Apple

In Apple's announcement of the LaserWriter, the Cupertino wizards pointed out that the controller inside the printer is really Apple's most powerful computer. With the power offered by this hardware, and the advantage of PostScript, the potential for superior output graphics has only begun to be tapped. As usual, firms with ability and organization will do a good job of supplying the basic tools—it's up to the rest of us to imagine, create, and distribute the truly innovative. ✚

Steve Rosenthal says that if you ever saw his handwriting, you'd know he was post script himself—proof, he adds, that he was born to kern.

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[SEE PAGES 86 & 87]

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CIRCLE 304 ON READER SERVICE CARD

SPEAKING OF GRAPHICS
BY ROBERTA SCHWARTZ AND MICHAEL CALLERY

The Graphics Tool Kit, Apple IIc tips, clip art for the Mac, Bouncy, and ThinkTank

A GRAPHICS MENAGERIE

In our last column we promised more about The Graphics Tool Kit from Demco Electronics, so here goes.

The Graphics Tool Kit gives your Apple II a true high-resolution, black-and-white display—640 pixels horizontally by 768 pixels vertically. In comparison, the standard Apple high-resolution display is 280 × 180 pixels, and double-high-resolution display is 560 × 180 pixels. (The Macintosh displays 512 × 384 pixels.) Only half of an image is visible at a time—the system provides a viewable vertical resolution of 384 lines. You can choose to view the top, middle, or bottom of the screen.

The Tool Kit consists of a large circuit board, which you can plug into any slot except slot 0 on an Apple II or Apple II Plus, and a passel of software to drive the board. A monitor cable connects the Apple's video output jack to the board, and another monitor cable connects the board to the monitor. Demco warns that the board consumes a lot of power and suggests that you remove it from the system when it's not in use. If you choose to leave it in the system, it may interfere with the operation of certain software, including ProDOS.

Installing the Graphics Tool Kit circuit board is simple, and the manual clearly explains the process. Demco includes a program you can use to adjust your monitor (or the circuit board) to provide an optimum display.

To use the Graphics Tool Kit, you'll need a high-bandwidth, high-persistence monochrome monitor such as the Apple Monitor III. The board operates in Interlace mode—only half the screen is written with each video scan; two video scans are required to paint the whole screen. Low-persistence monitors flicker as the dots from the first scan fade before the second scan has filled the screen. Readers who have seen the Videx UltraTerm enhanced video card operating in one of its dense-display modes are familiar with the problem.

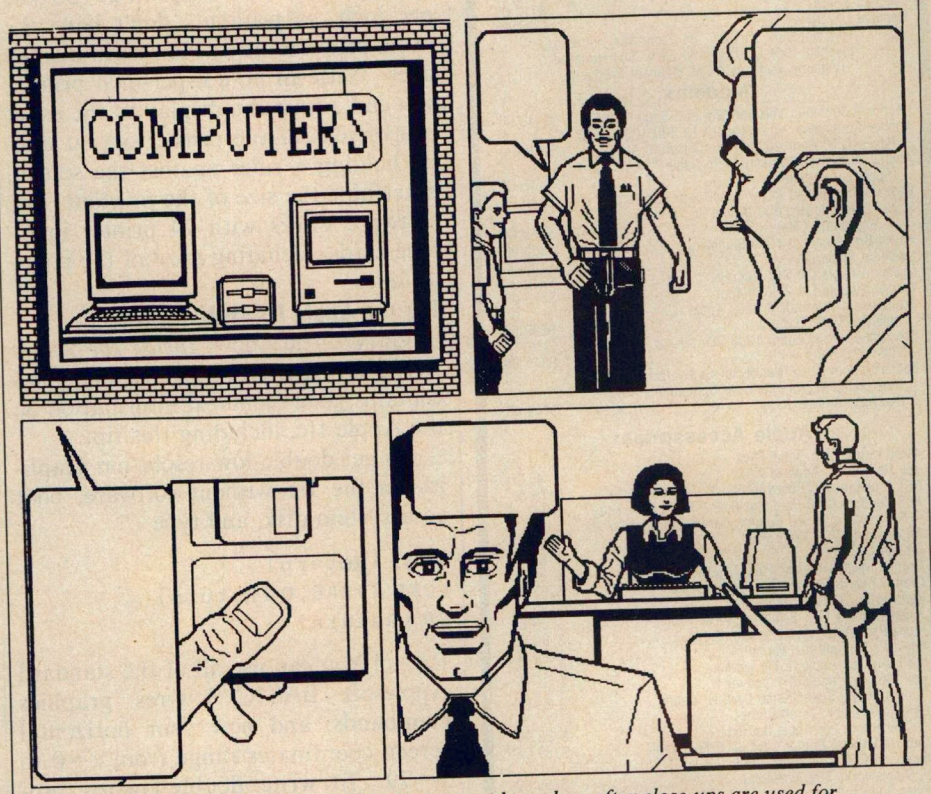

Figure 1: If you're familiar with comic-strip art, you know how often close-ups are used for dramatic effect. Artware Folio gives you a lot of impressively rendered close-ups.

Fonts and Shapes. The Graphics Tool Kit software includes a Graphics Editor, Shape Editor, and Font Editor, and an enhanced version of Applesoft BASIC allows users to write programs for the super-hi-res display. The software also supports Apple shape tables. Because the circuit board contains its own memory (64K), the area of memory the Apple normally uses for storing hi-res screens is free for use by programs.

The Graphics Editor is menu-driven and accepts input from the keyboard, devices that plug into the game port, and the mouse. You can draw freehand, using points or lines. You can fill an enclosed area with any of 16 patterns, including a good 8-tone gray scale. (These patterns are accessible with the HCOLOR command from the Tool Kit-enhanced version of Applesoft BASIC.) There is easy access to both fonts and shape tables, although, depending on their size, only one of the two may fit in memory at a time. Shape tables include flowchart elements, musical-note templates, electronic symbols, and so on. The software also provides an extensive set of block cut-and-paste functions, including the ability to save a block to disk for later retrieval.

The software isn't as convenient as many of the more recent paint pro-

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For the Apple IIc Only

Gary Little's book *Inside the Apple IIc* (Brady Communications Co., Inc.) contains good technical information on the Apple IIc, including this tip:

To get double-low-resolution graphics on the IIc without software, boot your system disk, and type

```
PR#3 (Return)
POKE 49246,0 (Return)
GR (Return)
```

Presto! You can use all of the standard Applesoft BASIC low-res graphics commands, and now your horizontal screen coordinates range from x=0 to x=79. To write double-low-res programs:

```
10 PRINT CHR$(4); "PR#3":
15 POKE 49278,0: POKE 49246,0
20 GR
30 COLOR = 5: PLOT 20,20: PLOT
   70,40
35 REM your graphics commands
   here
```

Michael tried this on the enhanced IIe, and it didn't work. (See "A Close Look at IIe Enhancements," *A+*, August 1985, pages 45–54.)

HumanForms for the Mac

HumanForms, Volume 1, from The Reference Corporation, is a clip-art package of MacPaint documents (see figure 2). Each document concentrates on one part of the anatomy. For example, Female Legs (Thighs Side View) contains 18 thighs drawn at seven dif-

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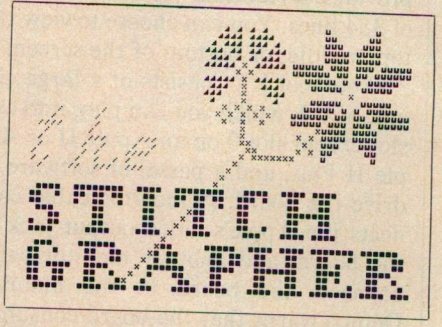

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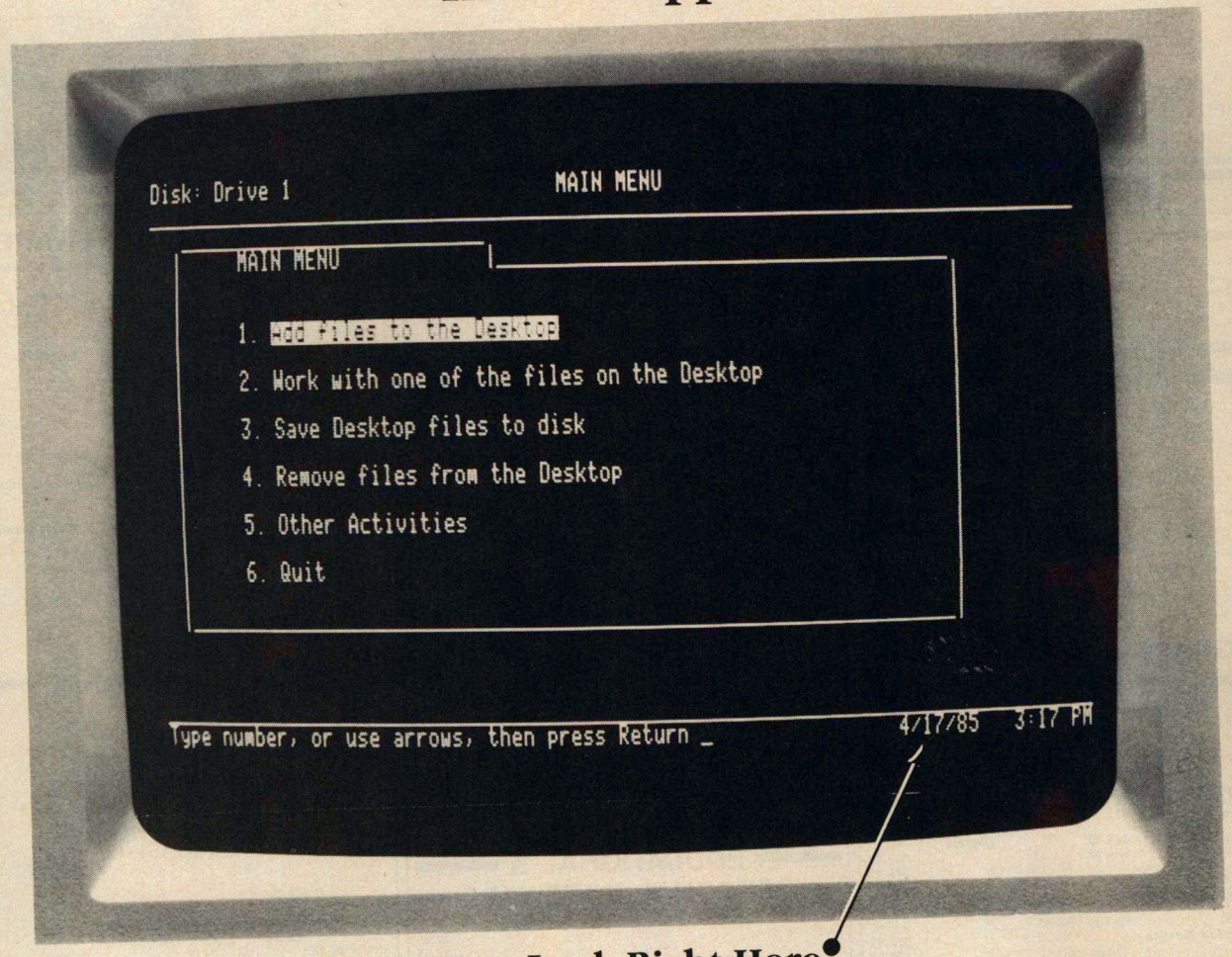

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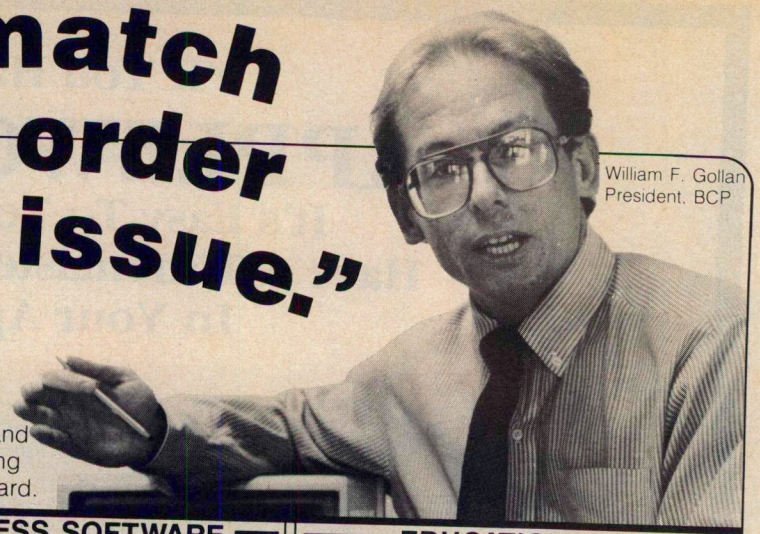

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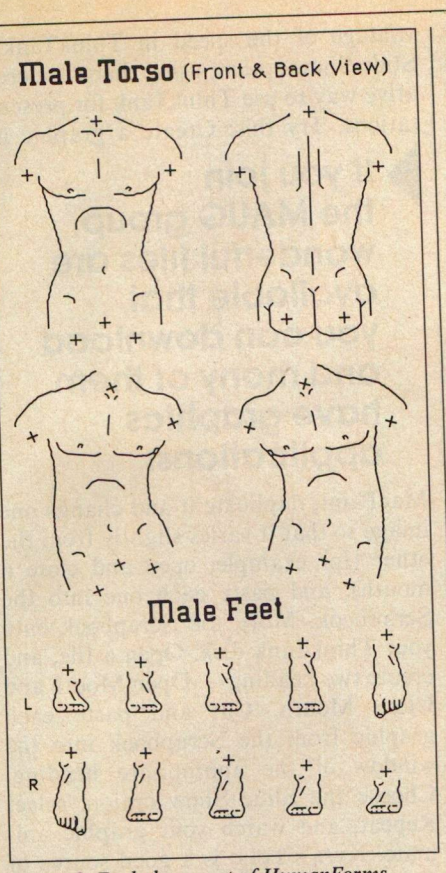

Figure 2: Each document of HumanForms concentrates on one part of the human anatomy.

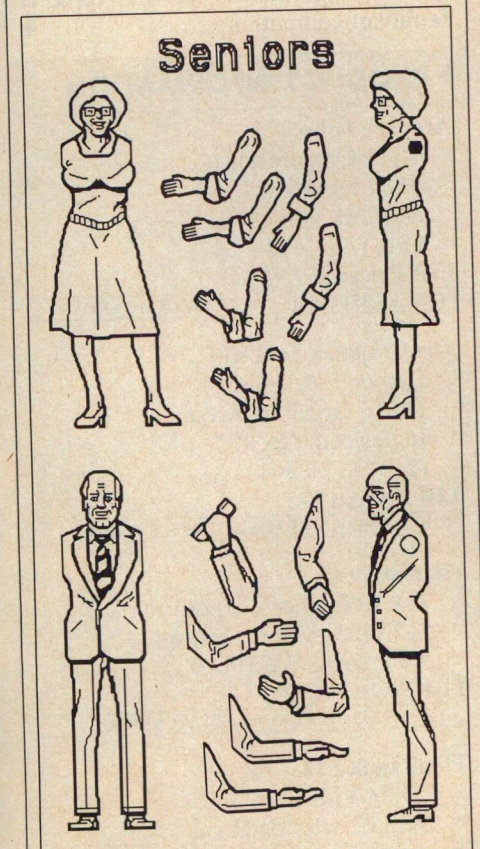

Figure 3: In Artware Folio, the clothed figures are fully drawn except for the arms. You lasso the arm position you need and paste it onto the figure.

ferent angles, Male Torso (Side View) has 18 torsos in various positions, and so on. Each body part has register marks. Using the MacPaint lasso, you can become a 20th century Dr. Frankenstein—gather the parts you need; align the register marks; paste; and, without a bolt of lightning, you've created a human figure. Add appropriate clothing, and your figures become dancers, models, or kung fu experts.

Drawing anatomically and proportionally correct human figures with traditional media is one of the most difficult assignments for an artist—with the limitations of the Mac's resolution, it becomes an awesome task. Therefore, we hesitate to criticize HumanForms, but we found some of the figures aesthetically unappealing. The male's upper arms are too muscular, and the faces and hands are cartoon-like. Still, HumanForms is a useful and welcome addition to the Mac line of clip art.

Storyboards, Comic Strips, and More

Artware Folio, from Kyra Corporation, is another innovative clip-art package for the Mac. Its format is that of a comic strip. The package contains two disks of MacPaint documents—faces and figures of men, women, children, and senior citizens. It also includes page layouts, dialogue balloons (see art on first page of this column), and technique documents that show you how to use the images. The clothed figures are fully drawn, except for the arms (see figure 3). Using the MacPaint lasso, you select the arm position you need and paste it onto the figure. If you're familiar with comic-strip art, you know how often close-ups are used for dramatic effect. Folio gives you a lot of close-ups, and most of them are impressively rendered.

We would have preferred that Kyra stick to the unique subject matter of Folio—more faces and figures—instead of including backgrounds and props that other clip-art packages for the Macintosh contain. We would also have liked it if the legs (like the arms) came in varied positions that you could paste onto the figures. Nonetheless, Artware Folio is a good package if you want to create comic strips, greeting cards, newsletters, storyboards, or title screens.

Graphics via Modem

For those of you who subscribe to CompuServe, we recommend that you join the MAUG group. Wonderful files are available that you can download, and many of them have graphics appli-

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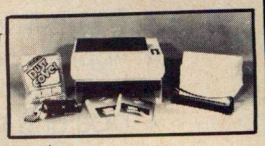

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cations. One Macintosh desktop utility called Bouncy does nothing more than make your cursor bounce around the screen like a ping-pong ball. We downloaded Bouncy, converted it with the Binhex utility program, and installed it as a desk accessory on a MacPaint disk. Next, we selected the paintbrush cursor in MacPaint, activated Bouncy, and held down the mouse button—the cursor painted as it bounced. Changing brush sizes and patterns is a real challenge because the cursor is in constant movement, but we managed to do it, and the result was an interesting, plaid-like design on the screen. Selecting Bouncy again makes the cursor move faster. The real challenge here is to make a selection (such as saving a graphic) by double-clicking the mouse before the cursor bounces away. It's possible, but very difficult. Have fun!

ThinkTank Animation

In the MAUG library you'll also find sample animation applications for Living Videotext's ThinkTank 512 (see "ThinkTank 512," *A+*, May 1985, pages 102–111). These files take advantage of the speed in ThinkTank's Slide Show option; using them is a creative way to use ThinkTank for presentations. Try this: Create a graphic in

If you join the MAUG group, wonderful files are available that you can download and many of them have graphics applications.

MacPaint, duplicate it and change one image so that it varies slightly from the other (for example, open and close a mouth), and paste each one into the Scrapbook. Move the Scrapbook onto your ThinkTank disk. Open a file, and create two headings—Open Mouth and Close Mouth. Cut and paste each graphic from the Scrapbook into the window of the appropriate heading. Choose the Slide Show option, select Repeat, and watch your graphic animate. Kyra's Folio is a good source of images.

In our next column, we'll tell you about some of MAUG's graphic utilities and applications for the Apple II family of computers +

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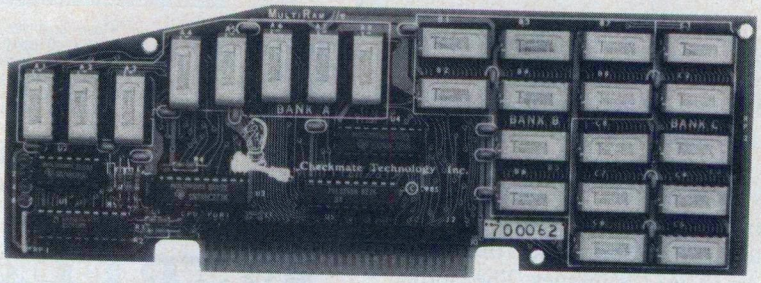

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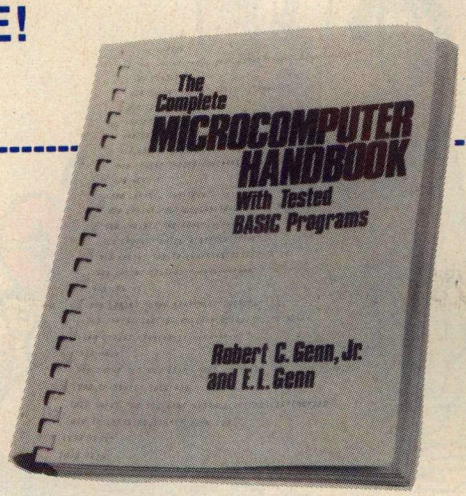

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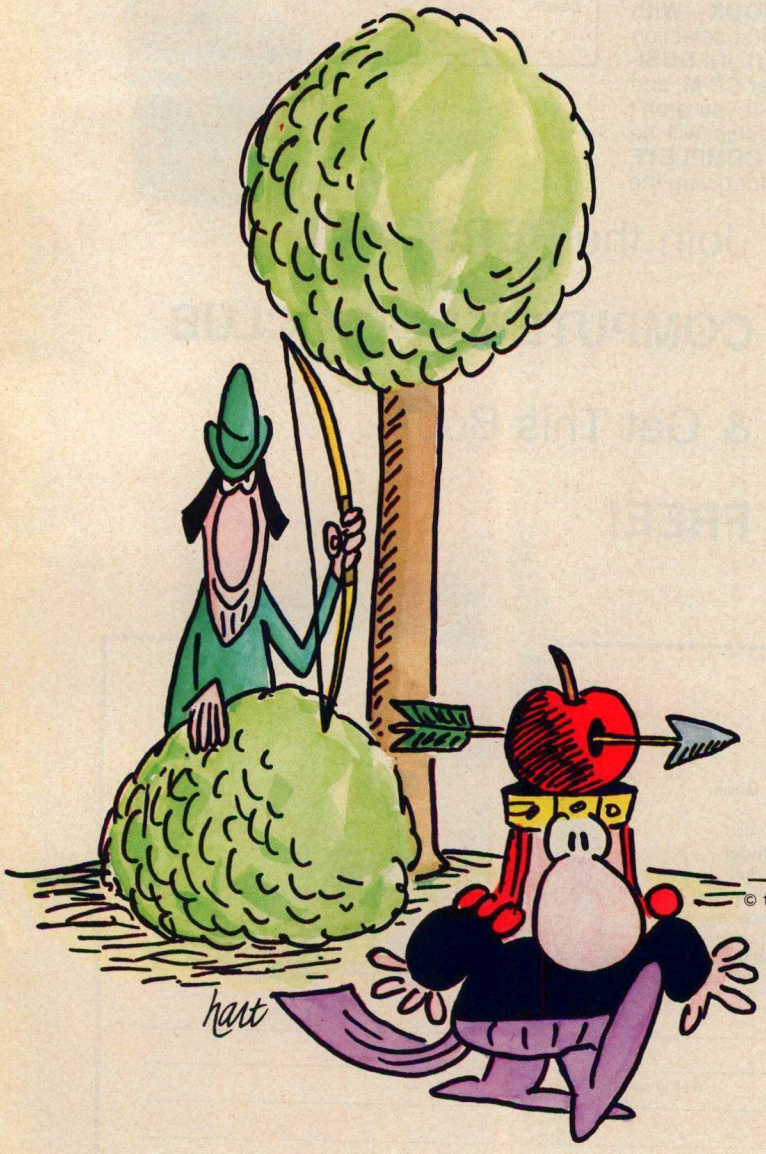

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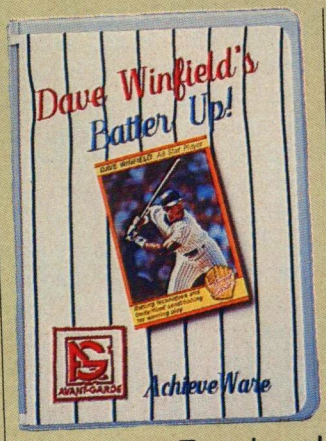


Too bad his season hasn't started out as good as his software, because Dave Winfield's Batter Up! is one baseball program that's worth cheering about.

SWING HIGH, LOW, OR DOWN THE CENTER

Dave Winfield hardly ever sees a clean strike.

For 12 seasons, the towering Yankee right fielder has offered pitchers an enormous strike zone. But no one wants to give Dave Winfield a good pitch. As possibly the finest all-around player in baseball, Winfield represents a threat every time he comes to the plate. Last season he hit a career-high .340, to raise his lifetime average to .289. This season, however, started out slowly—over the first two months, Winfield's average was only .243.

He's probably had to take some razzing about that in the dugout, especially this season. Here he is, Dave Winfield, attaching his name to a computer program that promises to teach the finer arts of hitting. And he's in a slump.

Worth Cheering About

Too bad his season hasn't started out as good as his software, because Batter Up! is one baseball program that's worth cheering about.

The concept behind Batter Up! is extremely simple—so simple, in fact, that without Winfield's name and visage on the package, you might overlook it. In essence, Batter Up! teaches you how to hit a baseball and then lets you try it yourself.

That's all there is. Nothing more. No nine-inning games to play or baseball trivia quizzes to answer, and no other fancy add-ons to distract you from the program's main purpose—to teach hitting.

And that's the magic. By keeping the design so simple, Batter Up! actually manages to do what it sets out to do.

Take a Swing

You're supposed to start with the tutorial, but let's be honest—everyone is going to try a few swings first. That's where the surprises really begin.

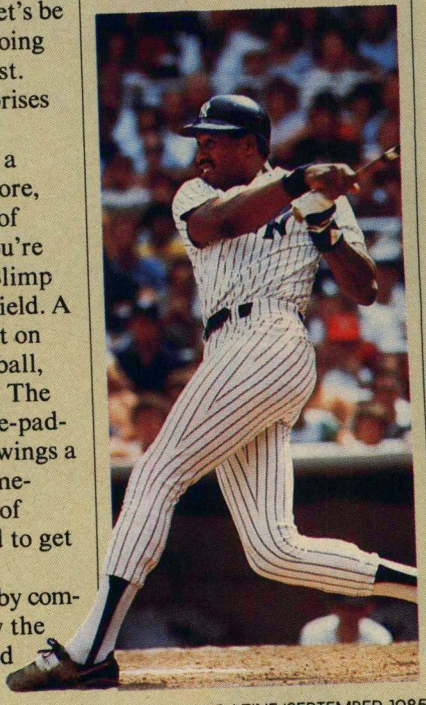
If you've ever seen a baseball program before, you know what most of them call *batting*. You're up in the Goodyear Blimp looking down on the field. A pitcher, actually a dot on the screen, throws a ball, which is another dot. The batter presses a game-paddle button, and out swings a colossal bat from somewhere in the middle of home plate. It's hard to get excited about a hit.

With Batter Up!, by comparison, you see only the pitcher on the mound and Winfield at the plate. The angle between them has been set so that you can actually watch the movement of the ball and make judgments based on what you see. Then, using either keyboard or game paddles, you can swing your bat high, low, or down the center.

If and when you make contact with the ball, the screen switches to a view from the blimp, so you can see where you hit it.

Play Ball

When you first start to play, you're given a sequence of choices. Pick whether you just want some hitting practice or a competitive "slugfest" (for up to four hitters). Both options present you with a se-



ries of choices. In the slugfest, you decide if you're a right-handed or left-handed hitter; set your batting stance; choose one of eight pitchers (ranging from a fastballer, to a curve-thrower, to a knuckler); and set the pitching speed.

Pick a park to play—parks include Winfield's current Yankee Stadium and his alma mater, Jack Murphy Stadium in San Diego. And, finally, you're ready to play ball.

As you play, the contest between pitcher and batter—the game within the game of baseball—unfolds before you. Say, for instance, that you're running a count of no balls and two strikes. Don't expect the next pitch to come sailing over the center of the plate. As in a real game, the pitcher makes decisions based on the current count.

Batter Up! keeps a detailed record of your performance. You can save it to disk and continue later if you want to maintain your average over a season's hitting. If you're a horrible hitter, as I am, you can start fresh every time.

During play, an umpire sometimes steps in to clean off the plate, or the pitcher reaches down for the rosin bag, or a pigeon flies in to revenge Winfield's much-publicized throw in Toronto that accidentally killed a bird.

Fortunately, Winfield doesn't take himself too seriously. When you're in the slugfest, for instance, the command keys spell out CASH, a not-so-subtle reference to Winfield's nickname—The 20 Million Dollar Man. He earned the nickname by leaving the San Diego Padres in 1980 to sign a $23-million, ten-year contract with the New York Yankees.

It would have been all too easy to play it safe and not use the background material. But the Avant-Garde programmers went ahead and had a little fun with Winfield's reputation.

Avant-Garde had a little fun with Winfield's reputation.

That's part of what makes this program so interesting. Winfield himself was apparently involved during its developmental stages, contributing most of the information the on-disk tutorial and accompanying handbook contain.

Together, the tutorial and handbook provide some good lessons on hitting for anyone from a Little Leaguer to a sandlot "softballer." Whenever possible, the tutorial teaches through an on-screen demonstration. For instance, you can watch an on-screen batter demonstrate the proper techniques for swinging at the ball, and you can then review those techniques frame by frame.

The handbook is a good, easy-to-read guide that displays some of the finer details that don't show up well on a computer screen (such as how the pitcher holds the ball for different pitches).

A good manual walks

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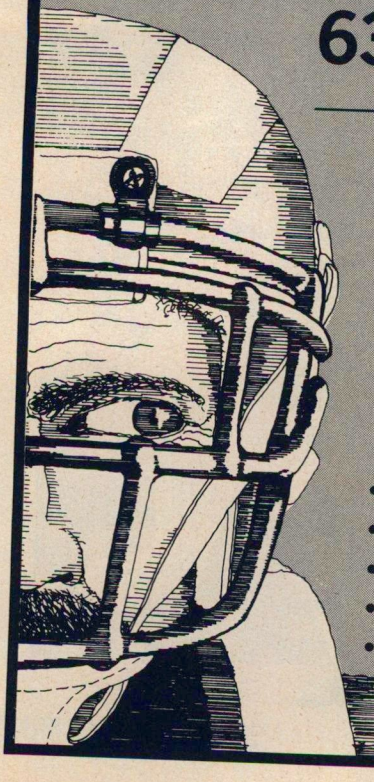

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you through the program. Although the same manual serves Apple, IBM, and Commodore users, it's set up so that it's easy to get the information you need about each system.

Now, after such a positive review, I'm afraid I have to pass along some bad news: Dave Winfield owns an IBM. I guess I understand. After all, Yankee pinstripes *are* blue.

J. Anthony Dirksen

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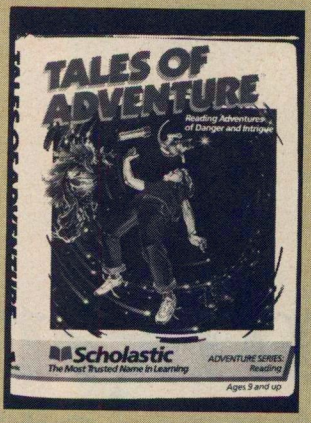

intrigue"—while at the same time getting them to read. Both stories on this two-sided disk put readers right in the center of the action.

In the tradition Scholastic has already established with its "Microzine" disk-magazine adventure stories, the plot and outcome of both stories change according to responses readers make while reading. Both are presented as simple, readable text made more fun by illustrations (for which a color monitor is nice, but not necessary).

The first story, "Adventures in the Microzone," is based on the always fascinating idea that you have shrunk so small that you're afraid the cat will mistake you for a toy. Piles of laundry in the bedroom and the workbench in the garage become mountains to scale. Depending on your choices, you may tumble over a jumble of drinking straws, tangle with a mouse, or meet the powerful Bee Woman.

You struggle to figure

out how to get back to your normal size as fast as you can, but the story is gentle—whichever choices you make—introducing just the right amount of tension and adventure without being frightening. Microzone includes a Skip option, too, which lets you go through the story's options many times without making you

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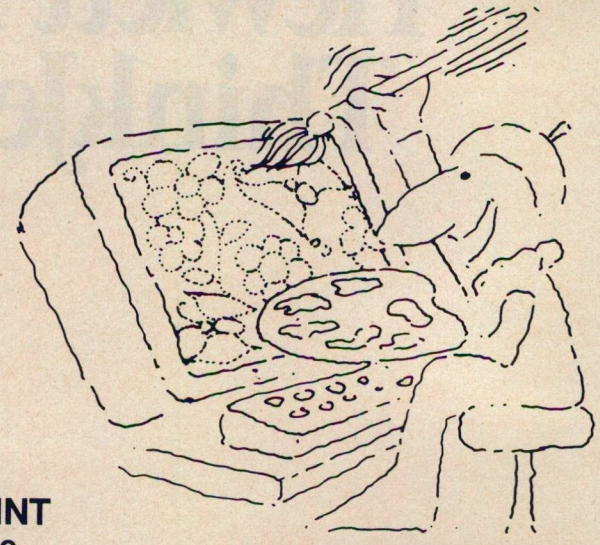

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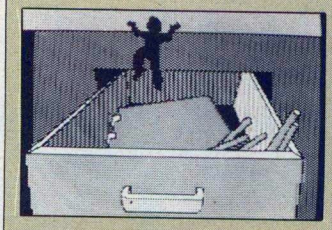

wait for graphics to appear as you try out different decisions.

In the second story, Northwoods Adventure, you must reach home before nightfall. Along the way you may guide your canoe through white-water rapids, find berries to eat, dodge a hungry bear, contend with quicksand, and climb a fire tower. In this program, you direct some of your adventures with arrow keys, but these action sections move too slowly to satisfy youngsters primed on arcade games, and they seem to digress from one of the main purposes of the program: to encourage reading. Overall, however, Northwoods Adventure is fun, well conceived, and presented with a refreshing sense of humor.

The folks at Scholastic have a lot of experience in teaching reading, and they have pioneered in capitalizing on computers' special attraction for young readers. Now they have progressed in making sound use of the computer's interactive capability, drawing youngsters into what they read. Tales of Adventure also encourages development of effective problem-solving techniques by presenting a problem to solve and providing feedback about what might happen, depending on decisions made. The manual even encourages youngsters to try making a flowchart for the different segments of the story. Documentation, both on- and off-screen, is clear and foresees possible problems.

Both programs also provide youngsters with the insight that actions have consequences and that there is more than one good way to solve a problem.

Of course, sitting children down with Tales of Adventure does not ensure that they will really read the stories. They could easily speed through Microzone and Northwoods, keying in choice *1*, *2*, or *3* and answering *Y* or *N*—without reading. The programs do provide an opportunity for reading enrichment, however. Although programs such as these will never replace *Charlotte's Web*, or even the Hardy Boys mystery books, they do provide an enjoyable educational experience for the 9-and-up age group.

Diane Moser

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THAT'S entertainment

A ROBOT SIDEKICK

Remember that great scene in *Forbidden Planet* in which Dr. Morbius (played by Walter Pidgeon) tells Robby the Robot to violate one of Asimov's three laws of robotics: "Robby, set phaser to kill and fire it at the Captain."—remember that? And Robby the Robot stands there, paralyzed, his brain circuits crackling with static and giving off a smell of ozone so strong you could smell it in the theater? Remember?

That's what it feels like to play Planetfall, another maddeningly clever all-text adventure game from the mad scientists at Infocom. Only this time, *you* get to be the one who burns out your brain cells—I'm sure that's exactly what the fiends who wrote this adventure intended.

This time around, you are a lowly seventh-class ensign, scrubbing the decks of the interstellar star cruiser Feinstein. (Who ever said space travel was romantic?) Don't get too far away from the doorway to the escape pod, because the Feinstein is about as spaceworthy as a 1954 Studebaker.

The *real* adventure begins when you arrive on Resida, a human-habitable planet that's mostly ocean. Your escape pod lands on a small island, and you're going to have to think fast here, too.

When you finally get into the installation, there are a lot of rooms to explore and a lot of objects around that may or may not be useful. The ladder, for instance, is useful only when it is extended. After considerable exploration, you will discover that Resida is a powerful demonstration of the sheer nastiness of Murphy's Law: If anything can go wrong, it will.

Resida has a plague, mutants running amok, a faulty master computer, a broken communication system, and a decaying orbit. The inhabitants of the planet are in suspended animation, and the repair robot is destroyed. The only remaining robot, Floyd, has been turned off.

As if that weren't enough, just about every room that has something in it that you will need also has a nasty little problem you have to solve before you can get into it. For instance, the key to one room has fallen down a crevice. How do you get it out?

But, of course, to someone as talented and clever as yourself—you weren't going to be a lowly seventh-class ensign forever, were you?—none of these things are *real* problems at all, just details to be handled—if you have enough time.

Like all of the Infocom games, Planetfall is clever and well thought out; the puzzles are intricate but not insoluble. (By the way, take a good look at the package the game comes in. Somebody had a good time here.)

Planetfall has the added attraction of a robot with real personality. Floyd is one of the best sidekicks you could have in an adventure game. He is useful, entertaining, and appropriately flaky. The real triumph of the authors here is that

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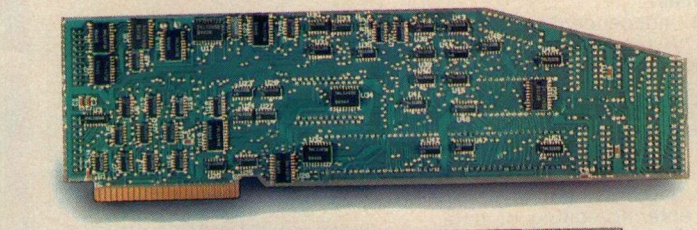

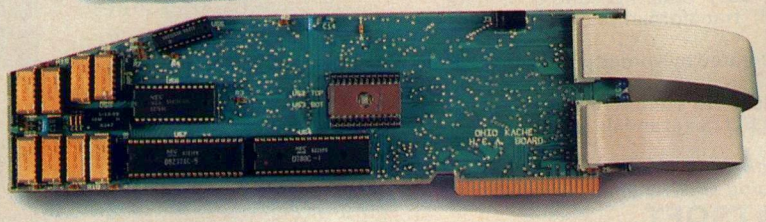

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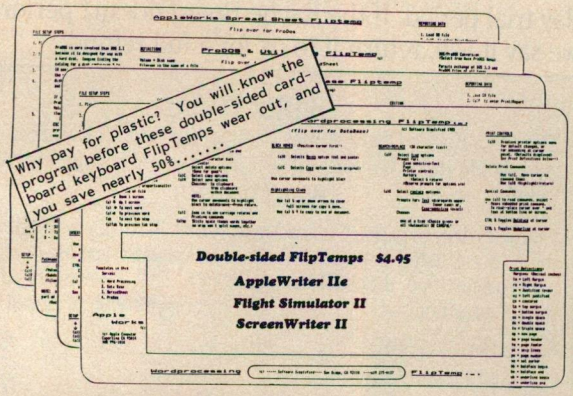

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THAT'S entertainment

Floyd's death is quite moving, possibly a first for adventure games.

I definitely recommend Planetfall to science-fiction and adventure fans, but with two cautions: First, make sure you have enough time to play it. This one may require some time. Second, you might want to invest in the Infocom hint book or one of the other hint books that are starting to show up in the bookstores these days. (Yes, I know, hint books are a kind of low-level cheating, but sometimes you just have to have help in combatting the vicious microbes.) If you have brain cells you want to burn out, Planetfall will take care of the job.

David Gerrold

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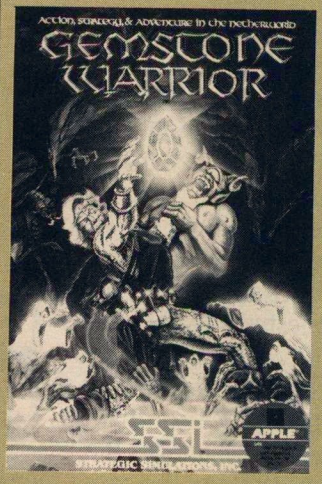
Strategic Simulations bills its Gemstone Warrior as a game of action, strategy, and adventure in the netherworld. I don't know about the netherworld, but action, strategy, and adventure it is—a fast-paced combination arcade and adventure game.

Gemstone Warrior has a lot in common with the Dunjunquest (Hellfire Warrior) series from Epyx, without burdening you with the tediousness of creating and arming your warrior. Your task as Gemstone Warrior is to search the maze of the Demons' lair for the five pieces of the Gemstone, a treasure with magical powers that can save humanity, and rescue them from the Demons'



grasp. The Demons have stashed away all the wealth of the world in the maze, as well, and it is there for your taking if you can defeat the monsters that guard it.

You move through the maze, controlling your warrior's pace, direction, arrows, and magic bolts, either with the keyboard or a joystick. In addition, you have at your disposal several magic objects, such as a wand that can freeze monsters, a ring that makes you invisible, and a goblet of healing fluid.

As a beginning warrior, you will have a difficult task, if you are using the keyboard rather than a joystick, in learning which keys to use to produce the effects you want. The game allows you a great deal of flexibility, including diagonal shots and quick movement, but keyboard control is complicated. If you can think of key combinations that make better sense to you than the programmed ones, you have the option of changing them.

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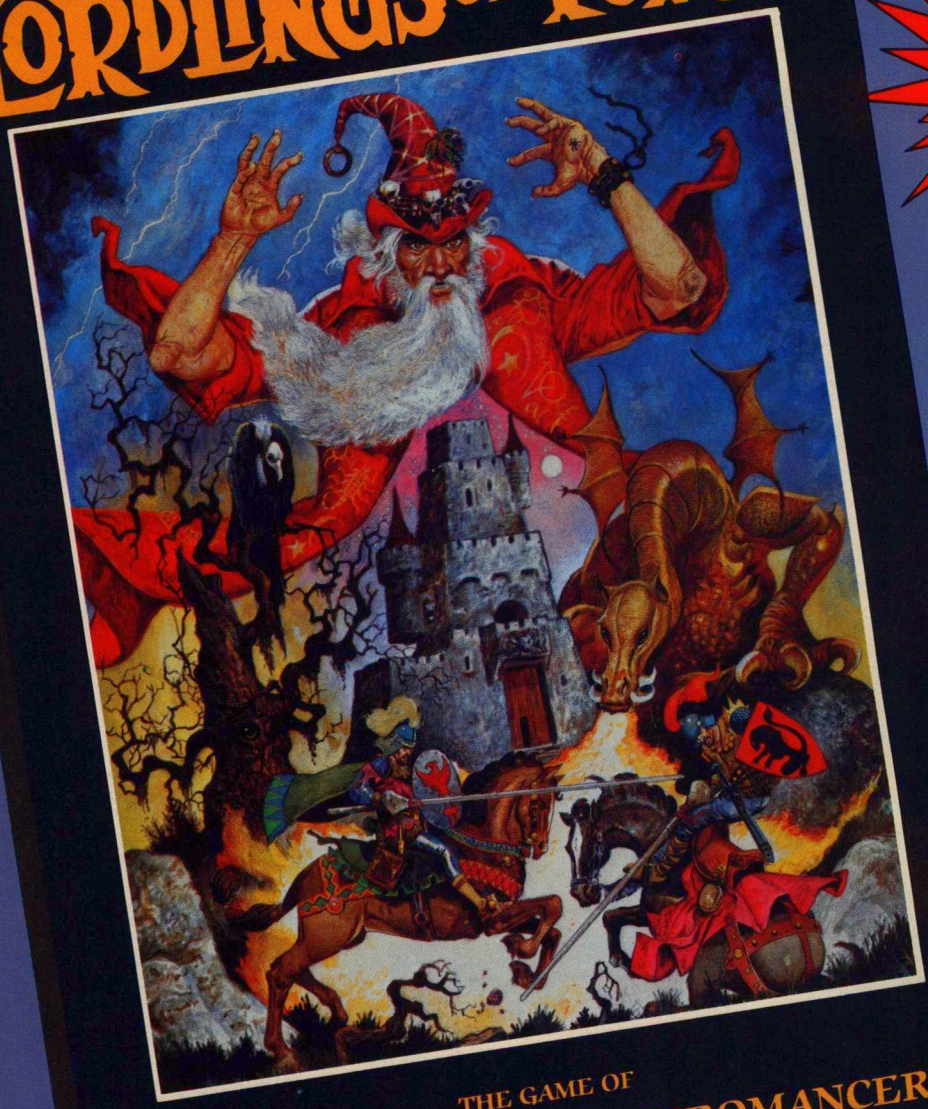

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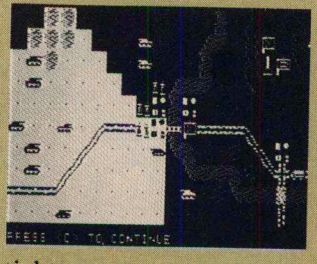
CIRCLE 318 ON READER SERVICE CARD

THAT'S entertainment

studying the manual before beginning—concentrate on the use of magic items, searching, and picking up treasure and other items. The items you have in your inventory appear as icons at the bottom of your screen. A box surrounds the one that is ready to use, and you can move objects in and out of this box—an item has to be in the box before you can use it. The same box shows you the results of a search.

All these conventions can be confusing when you are under fire from a giant amoeba or a contagious shambler. The keyboard controls for searching an area and for picking up objects are strange indeed, but don't fail to search every coffin, chest, and dead monster—even if you hear more skeletons and thieving fliers around the next bend. Nearly every one holds a wealth of treasure and useful items, and with every treasure you pick up, your score will mount visibly. The magic items are essential to your success, since they are powerful and can save you when you are on the brink of death or when conventional weapons don't work.



Speaking of death, a life bar shows how much damage you have suffered from the attacks of monsters or from negative magic items. Keep your eye on this indicator! It's easy to be so worried about shooting a skeleton that you pay no attention to your health. If necessary, beat a quick retreat or hide behind a rock to gain some time to heal or find a handy potion. Gemstone Warrior puts a premium on speed—the warrior who hesitates is dead.

The game has beginning, normal, and kamikaze levels, with faster and more vicious monsters at the higher levels.

The graphics of Gemstone Warrior are ambitious. Through the use of icons, the designers have tried to get away from the text-oriented tradition that has bound so many similar games. Unfortunately, it's difficult to make out the difference between a flask of regenerating potion and a bottle of poison—and, on top of that, the manual is vague about the effects of many of the magic items.

The sound turns off, for those late-night sessions when the rest of the house is sleeping (but with the sound off, you can't hear the monsters coming before they appear on-screen). When you're too tired to continue, but you've racked up a lot of points, you can save the game.

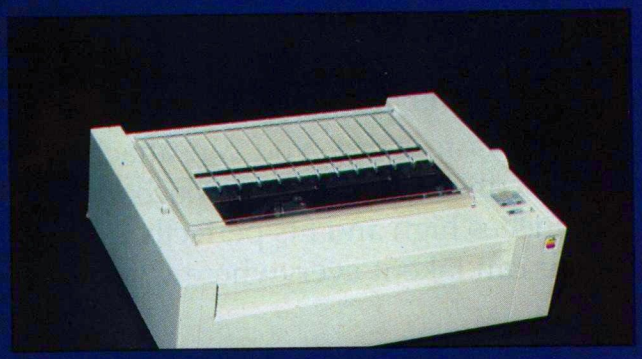
All in all, Gemstone warrior is good fun—fast-paced, challenging, and rewarding—and it's well worth the trouble it takes to decipher the manual and learn the ropes.

Diane Moser

Gemstone Warrior
Strategic Simulations, Inc.
883 Stierlin Road
Building A-200
Mountain View, CA
94043-1983
(415) 964-1200
List Price: $34.95
Requires: Apple II Plus, IIe, IIc with 64K; joystick recommended

CIRCLE READER SERVICE NO. **368**

THE RIGHT CONNECTIONS

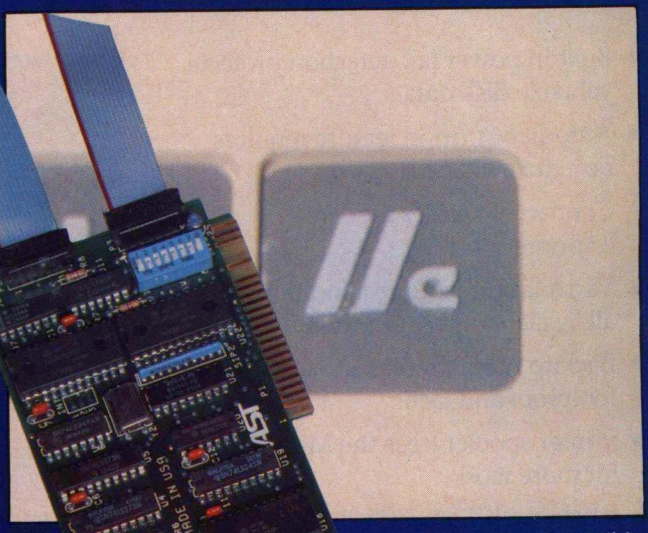


Printer serial port

Modem serial port

Clock/Calendar

Software Utilities



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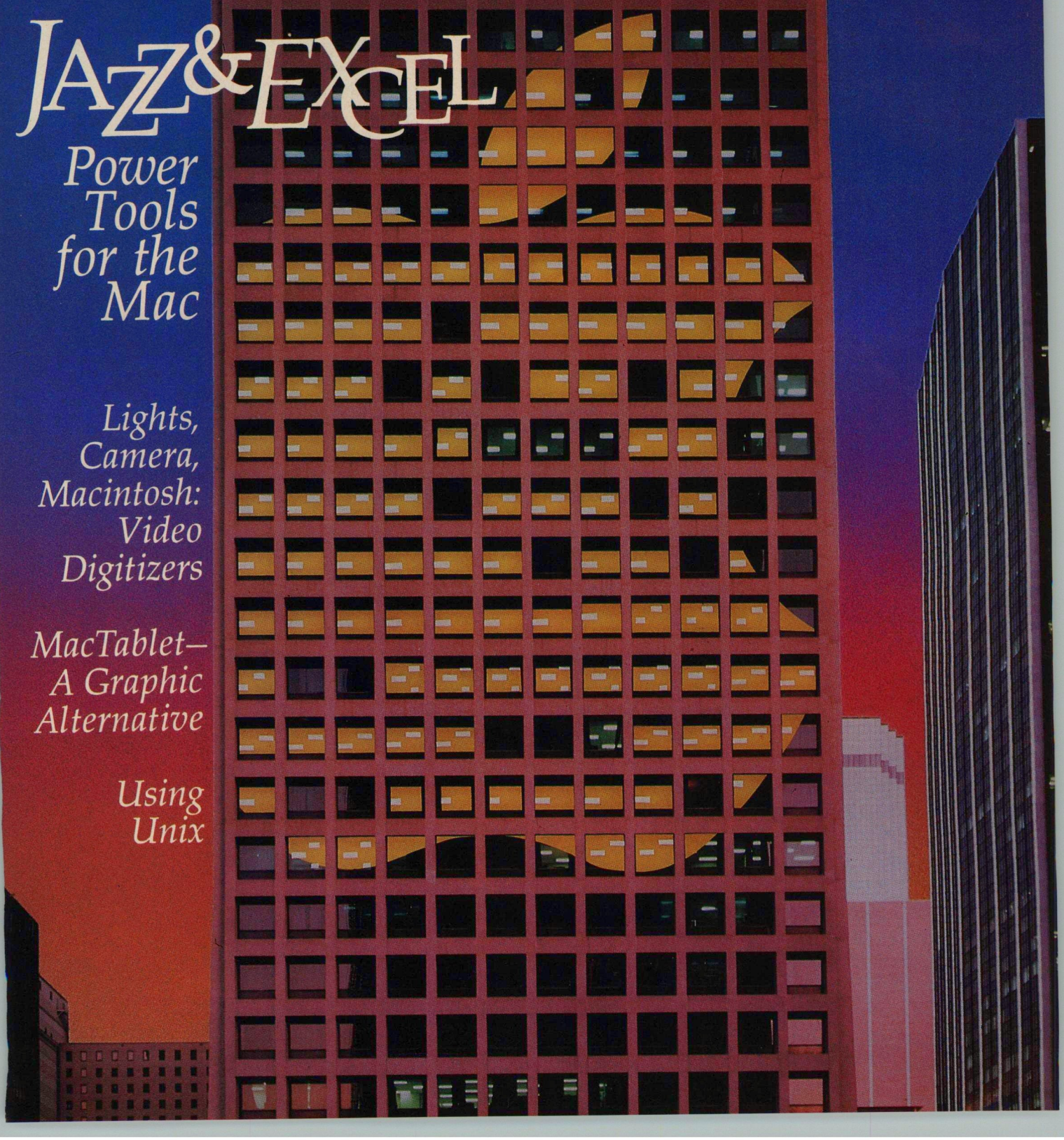
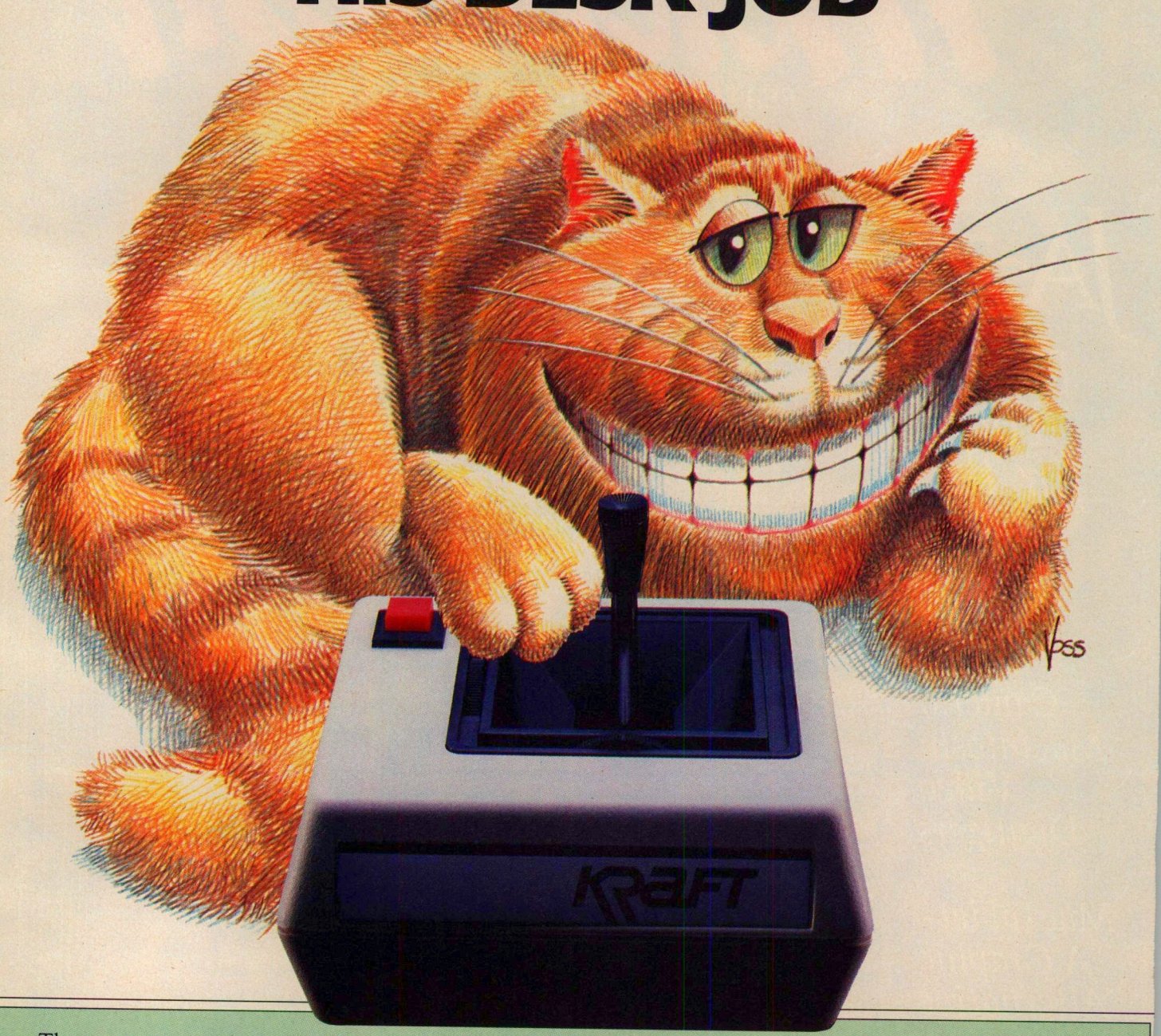


THE MOUSE JUST LOST HIS DESK JOB



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APPLE MEANS
Business

COVER STORY
BY STEVE ROSENTHAL

The Mac gets new ammunition in its battle for business users.

JAZZ & EXCEL

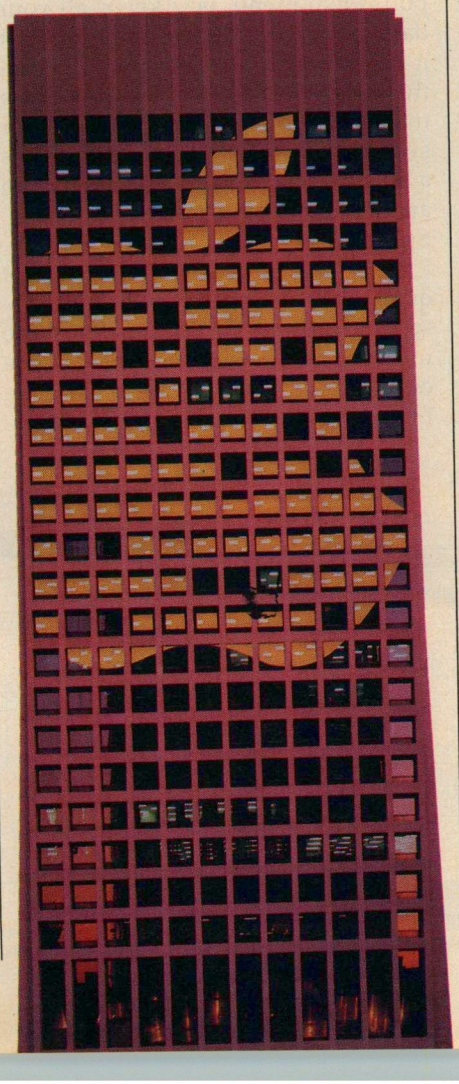
Even though a marketing battle seems to be brewing between Jazz from Lotus Development and Excel from Microsoft, hold on a minute before you enlist in one camp or the other. These programs differ not only in price and features (see accompanying chart), but also in what they assume about your working style and philosophy.

The single most striking difference between Jazz and Excel does not reside in the list of features, the pricing, or even in the user interface, but in their differing philosophies. Jazz aims for breadth, Excel for depth.

Jazz, which Apple and Lotus have been promoting since the early days of the Macintosh, combines worksheet (or spreadsheet), database, charting, word-processing, and communications capabilities. It needs at least a 512K Macintosh with two disk drives.

Excel, known at Microsoft as "the ultimate spreadsheet," combines a row-and-column worksheet, graphics, and a powerful macro capability (see "Thoughtware," on page 17 for details). It also requires a 512K Mac and two disk drives.

Officially, Jazz first shipped to users at the end of May, while Excel at that point was showing only beta-test versions to key corporate accounts and press people. Excel is scheduled for delivery this month. These dates would seem to put Jazz several months ahead of Excel, thus making it unfair to compare the two programs. Even in the test version, though, Excel is almost as reliable and polished as Jazz is, so we've taken the liberty to draw some working conclusions. Be warned, however, that I base this comparison on Jazz Version 1.0 and the Excel prerelease of June 6. Both firms are working feverishly on updates.



A QUESTION OF PHILOSOPHY

Previous successful products from their respective companies tend to define both Jazz and Excel—Jazz is a descendant of Lotus Symphony, and Excel, a descendant of Multiplan, is an analogue of Lotus 1-2-3. From another perspective, Jazz aims to be a complete, everyday solution for general "knowledge workers"; Excel focuses on the desktops where people work primarily with numbers. You can extend both programs as needed, however, by using independent accessory products.

If you're a business Macintosh user, Lotus seems to be saying that you're probably not using your computer to work with numbers all day. After all, the Mac's most striking innovations are in the areas of text presentation and graphics. If you wanted to work primarily with numbers, you could have gone out and bought an IBM Personal Computer.

On the other hand, there's no denying that spreadsheet products (with Lotus' own 1-2-3 first among them) have been the most popular business application for desktop machines. Some estimates say that as many as three-fourths of the buyers of personal computers for businesses use their systems largely for spreadsheet computation—one reason that IBM has sold so many of its IBM PCs.

We can add to the equation that Lotus is already getting most of those spreadsheet dollars. Lotus knows that if you're planning to take the standard corporate path, chances are

you'll buy a computer with MS-DOS and/or PC-DOS and a copy of 1-2-3.

To supplement its revenues, rather than cannibalizing its present market, Lotus has to go after a new class of users. Rather than the IBM PC/AT "power user," Jazz is aiming at the "renaissance worker." Jazz users are improvisers.

Although Microsoft has met with critical acclaim for its Mutliplan spreadsheet, sales of this product haven't been approaching those of the 1-2-3. Microsoft's main strengths are its operating systems and its language products—both of which appeal to a more technical audience.

To build on that strength, Microsoft has staked out a position on the high-power end of the spreadsheet market. Microsoft *has* designed Excel to appeal to the same people who might otherwise have bought 1-2-3, but it has designed Excel to be bigger, better, and more capable than 1-2-3. Excel users are going for the limits.

The obvious conclusion is that although these two products overlap somewhat, they're not designed primarily for the same users or the same precise market. In addition, Jazz and Excel have to compete in the market against a half-dozen other integrated packages for the Mac, plus the roll-your-own solution of combining stand-alone packages with Apple's Switcher. Because the programs don't completely share the same set of objectives, making an evaluation is a bit more complex. The first question therefore becomes: How well does each program meet its own goals?

Jazz provides the basic set of personal-computer tools you need for a job in middle management.

JAZZ

Jazz provides the basic set of personal-computer tools you need for a job in middle management or as a working professional. The five major program areas work efficiently and reliably, with excellent data exchange between them.

The Jazz display has its own desktop, where you can open multiple documents and program areas, one on top of another (just the way you can open disk windows on the main Macintosh desktop). You can switch between applications by clicking to make a window active or by choosing the window you want from a list in a pull-down menu. Jazz keeps all your data in memory during a session, but it pages parts of the program in from the disk as needed. This procedure makes initial program loading or switching between application types a bit slow, but performance within an application is quite good.

Spreadsheet

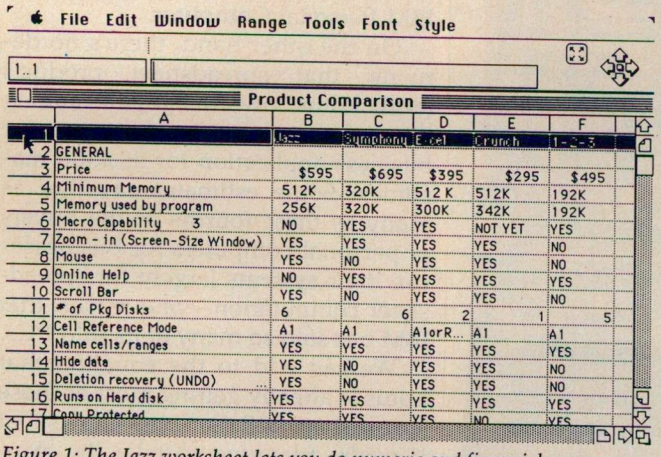
The Jazz spreadsheet, though not quite a match for Excel's, is quite respectable—and far better than the more modest versions in AppleWorks or VisiCalc on the Apple II, or even Ensemble and Quartet on the Macintosh (see figure 1). Along with the usual capability to enter numbers, text, and formulas into cells, and to recalculate manually or automatically, the Jazz spreadsheet features named ranges, on-screen adjustment of column widths, a large complement of functions, and a collection of parsing settings to allow you to read data into the worksheet from any Mac text document on the Clipboard.

Note that the spreadsheet stores all cells within the rectangle that encloses your most far-flung entries. So, although the spreadsheet is specified as close to 8000 rows by 256 columns, you'll find that you can't have much of the 256 if you go for the 8000, and vice versa. With a 512K Mac, figure on approximately 16,000 usable cells.

Database Functions

You can do list and database work in two ways using Jazz. The Database mode offers both a row-and-column format (a "flat file") and a forms-based presentation. Database functions are easy to use, but you'll probably have to spend a few hours working on your first complex report—as with most database programs, it's a lot easier to get formatted data into this one than it is to get formatted data back out.

In addition to using the Database mode, you can also do many database tasks right on the row-and-column worksheet (one reason Lotus calls it a worksheet instead of merely a spreadsheet). By using text functions, sorting, and text entries, you can compile lists and print out tables.



	A	B	C	D	E	F
1		Jazz	Symphony	Excel	Crunch	1-2-3
2	GENERAL					
3	Price	$595	$695	$395	$295	$495
4	Minimum Memory	512K	320K	512 K	512K	192K
5	Memory used by program	256K	320K	300K	342K	192K
6	Macro Capability 3	NO	YES	YES	NOT YET	YES
7	Zoom - in (Screen-Size Window)	YES	YES	YES	YES	NO
8	Mouse	YES	NO	YES	YES	NO
9	Online Help	NO	YES	YES	YES	YES
10	Scroll Bar	YES	NO	YES	YES	NO
11	# of Pkg Disks	6	6	2	1	5
12	Cell Reference Mode	A1	A1	A1orR...	A1	A1
13	Name cells/ranges	YES	YES	YES	YES	YES
14	Hide data	YES	NO	YES	YES	NO
15	Deletion recovery (UNDO)	YES	NO	YES	YES	NO
16	Runs on Hard disk	YES	YES	YES	YES	YES
17	Copy Protected	YES	YES	YES	NO	YES

Figure 1: The Jazz worksheet lets you do numeric and financial calculations, or you can use it for tables and databases.

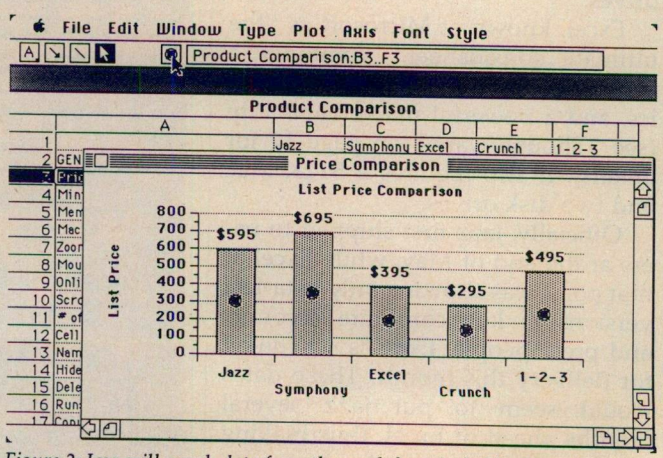


Figure 2: Jazz will graph data from the worksheet in half a dozen formats. Here are the prices of comparable products graphed as a bar chart.

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$119 — **Word** by Microsoft — Mac's word processing program. Capable of merging mailing lists and will "window" up to 4 pieces of work.

$99 — **Basic** *new version* by Microsoft — Put control buttons in windows, invent menus for a menu bar and dive into Mac's graphics.

$89 — **Dollars and Sense** by Monogram — A home accounting package. Just right for the small business. Bar and pie charts, etc.

$104 — **1st Base** by DeskTop — Create your own files. Enter, edit, sort on multiple fields and produce reports from single or joined files.

$55 — **1st Port** by DeskTop — A communication package which enables you to convert different data formats with a variety of Macintosh programs.

$55 — **1st Merge** by DeskTop — Merge your MacWrite documents, memos, and letters with your own data file to produce mass mailings.

CALL — **Jazz** by Lotus — The most sophisticated, integrated package created for business use. Includes spreadsheet, graphics, database, and communication capabilities. *(Requires 512K & 2nd Drive)*

CALL — **Excel** by Microsoft — One of the finest integrated packages for business available. Complete with database, graphics, and spreadsheet.

$174 — **Ensemble** by Hayden — An integrated package which includes spreadsheet database, and word processing. Runs on 128K with one Drive.

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$119 — **MegaFiler** by Megahaus — A file management system that lets you file and retrieve information. Mailing lists, orders, invoices, inventory.

$75 — **MegaMerge** by Megahaus — The mail-merge program for MacWrite. Create form letters, print mailing labels, and combine documents.

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$29 — **Airborne!** by Silicon Beach Software — A battle game with the most dramatic and realistic sound generation available on Macintosh.

$35 — **Verbatim** by DataLife — A 3.5" single and doublesided precision floppy disk.

$164 — **Maccountant** by digital, etc. — Small business accounting/financial package. Prepare ledgers, statements, payables, receivables, and write checks.

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CIRCLE 289 ON READER SERVICE CARD

Once you get your numbers down in the worksheet or database, you can print them out directly in text or chart form, or you can show them as any of a wide range of charts.

You won't win any artistic awards with the Jazz charting subprogram, but it won't take you long to turn out attractive and useful business graphics. You can select the ranges you want to chart and add axes, labels, legends, explanatory lettering, and arrows and lines (see figure 2). So far, though, I've been unable to paste in MacPaint graphics to dress up the graphs.

Word-Processing Program

Jazz's word-processing program resembles the early, memory-based MacWrite. You set your margins and tabs on an on-screen ruler and mark text with the mouse, and any text you type is automatically formatted within paragraphs. You can pick the usual, wide Macintosh range of fonts, typestyles, and sizes.

For the basic memos, reports, and letters that you do every workday, this portion of the program is quite sufficient and easy to use. If you're a full-time typist, you might want some other program with more features.

Performance seems generally good, with a few obscure rough spots. For example, with certain combinations the search-and-replace activity is glacially slow—it took about 11 minutes to replace all the double-letter spaces in a five-page document with single spaces. Furthermore, you can't reliably search and replace strings that include a tab character, even if you use the MacWrite trick of pasting the tab into the dialog box.

Jazz's principal advantage over a set of common-design stand-alone packages is data integration.

Text documents seem to be the assumed primary output of Jazz users. The Hotview capability, discussed below in more detail, brings worksheets and charts into the word-processing program area, and this area is the default for documents that you receive over the communications link.

Communications

The communications program appears to be the least intuitive part of the package, although simpler than most programs of its ilk. It comes ready to go to work as a "dumb" terminal (one that merely sends out keystrokes and displays incoming text), or you can pick various menu choices for file transmission and reception. In addition to plain text transfers, it will do XMODEM (Christensen) protocol and Jazz-to-Jazz transfers (which send the formatting information as well as the text). All those confusing communications parameters are tucked away so you don't see them if you don't want to change them. On the other hand, the program doesn't give you a lot of guidance for these settings, and the manual suggests you consult an expert.

Note that when you set the communications program to capture data, it does so to a file you specify—the file that you open for the communications session saves the communications settings, not the contents of what was sent or received. When I was testing this part, I found out the hard way why Jazz doesn't presently support the Corvus hard-disk drive: if you try to start up the communications program with a hard-disk drive connected to the modem port, Jazz crashes—because the program expects to find a modem connected to that port. I was able to get around this by first getting the program running on floppies and then changing the communications connection to the printer port.

Data Integration

Jazz's principal advantage over a set of common-design, stand-alone packages is data integration. All of the Jazz applications have provisions to ship data in and out via the Clipboard, and the worksheet also reads 1-2-3, Symphony, and SYLK (Multiplan) files. You can also dynamically link data from a worksheet or database to graphics, and from any of these to a word-processing document. With this feature, which Jazz calls Hotview, any change you make in the underlying document also appears in any document that contains one of these links (see figure 3).

Thus, if you have a memo that contains the quarter's sale figures, and if you update the figures on your worksheet, this activity also adjusts your chart and graph in the memo. Considering that one of the main reasons people like spreadsheets is the ease with which they can update figures, having this dynamic link should save a lot of time reediting memos.

I tried importing a 1-2-3 document

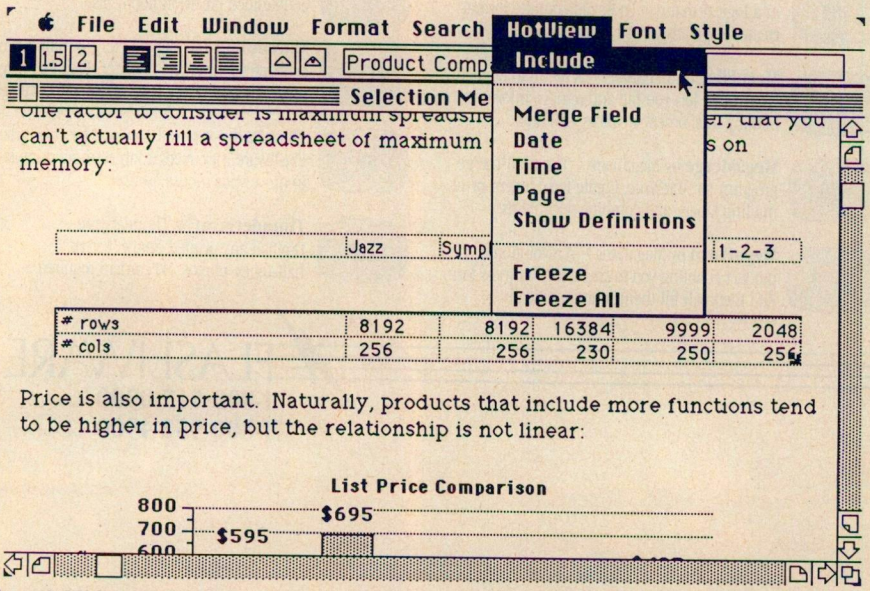
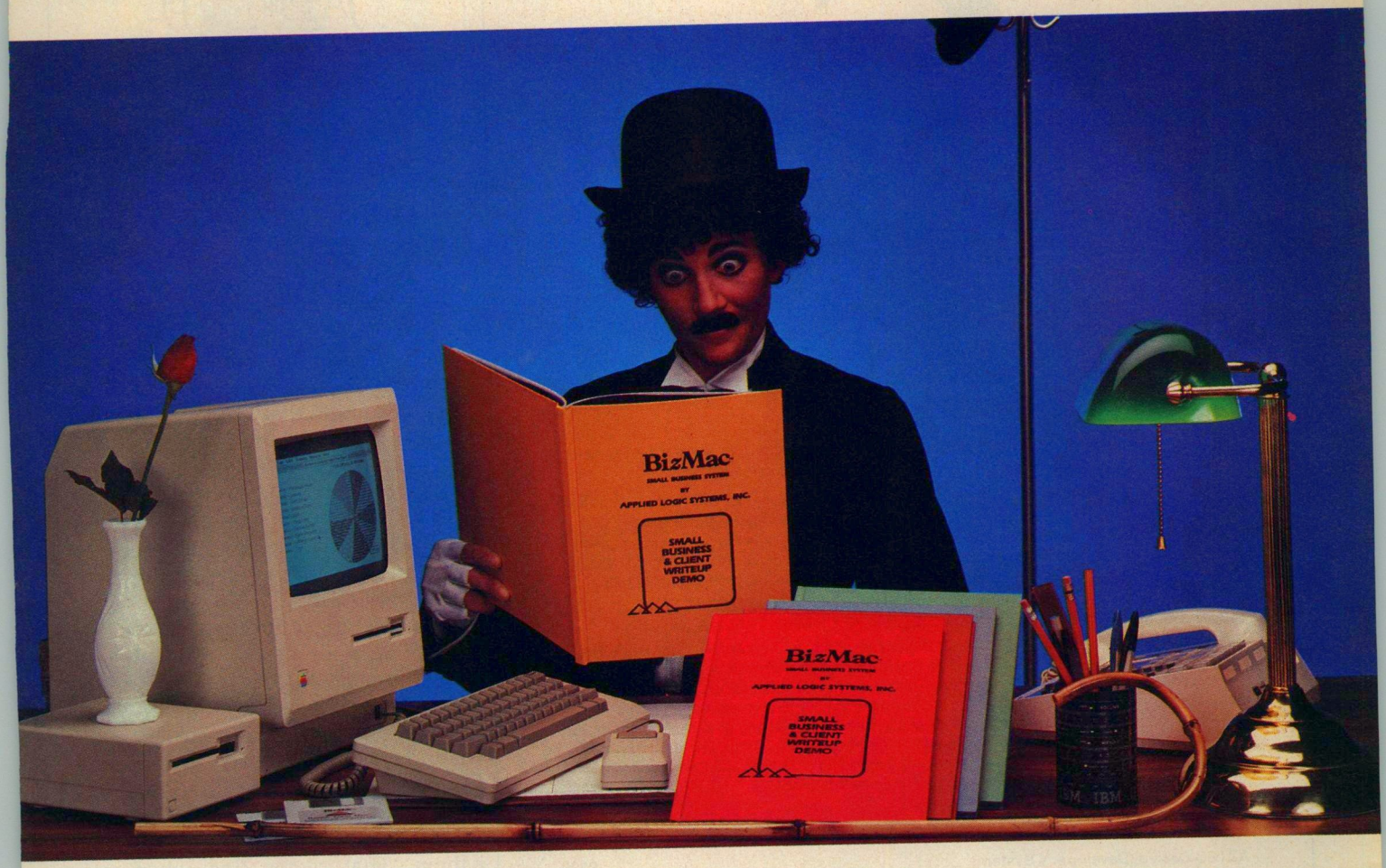


Figure 3: With Jazz's Hotview you can incorporate worksheet cells and graphs into memos. If the data or graph changes, Jazz automatically updates the memo.

If you thought all small business accounting software was made only for IBM, think again...



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JAZZ & EXCEL

Unofficially, Lotus says that Jazz will continue to evolve.

(which worked fine) and a Multiplan spreadsheet (which didn't work as well). The Hotview feature indeed made the promised changes. Unfortunately, if you use a Hotview (link) in a document that's not on your current disk, any change you make will bring forth the Mac's plaintive Please insert disk message and a round of disk shuffling. If you don't have a hard-disk drive, it's probably best to confine Jazz links to files on the same removable disk.

Have Technical Support Handy

Along with the program on two disks (one of which is copy-protected, but you get one backup), the Jazz package includes a reference manual, a primer, and some fancy cases for the various components. The manuals are beautifully produced, but they total only about 400 pages between them. That seems fine when you open the package, but you'll eventually find yourself wishing for more technical details.

Lotus relates to users primarily through its dealers, but it does give you a technical-support-line telephone number (not toll-free). Although most of the calls I've made have been answered quickly and correctly, I have also waited on the line for more than an hour without being told that members of the technical support staff were in the middle of moving between buildings and that there might be problems. When you're using a program with so many options and features, you're better off if you have available a supportive and competent dealer or a technical whiz.

Unofficially, Lotus says that Jazz will continue to evolve, with macros and possibly sparse arrays (no storage wasted on empty cells) among the probable improvements. So far, though, no formal announcements have been forthcoming.

EXCEL

Microsoft based the spreadsheet portion of Excel on its existing Multi-

MICROSOFT CHAIRMAN BILL GATES TALKS ABOUT EXCEL

Q. What does Excel mean to Microsoft?

A. Excel symbolizes our commitment to the philosophy of developing application programs. In spreadsheet state of the art, it is a leader. Coming out with Excel on the Macintosh first represents an ongoing corporate commitment to the Macintosh.

We have more than 100,000 customers using Multiplan on the Mac, and Excel gives them an upgrade path. In fact, if they already own Plan and Chart, they get the upgrade for only one hundred dollars, which means that Microsoft is committed to really working with those users.

Microsoft is not trying to do all-in-one software. We're going to do one product that's focused on numbers, another for databases, another focused on word processing, and so on. And we're going to use an environment such as the Macintosh with Switcher, data interchange, and a common user interface to integrate these separate tasks. In some ways Excel is really an announcement about the approach we will be using on our products in the future.

Q. What does Excel mean for the Macintosh?

A. The Macintosh has been positioned as a machine that's easy to use. It is easy to use, but that message has overshadowed the fact that it is a very powerful machine. Previously, when users considered buying a Mac, they had to say, "What can the Mac really do better than other machines?" And that's really a question of what type of software is available. It takes a new generation of software to show you the machine's power. With the introduction of Excel for working with numbers, the Macintosh now has the best solution on any machine.

We think Excel will do several things for the Mac. It will mean that people who want to work with numbers are much more likely to buy the Mac. It will really help people understand the incredible power that is built into the machine. And even though Excel is much more powerful than previous spreadsheets, we feel strongly that it is easier to use than previous spreadsheets.

Q. What does Excel mean to business-computer users?

A. When spreadsheets were originally conceived, they were thought of primarily as tools for business forecasting. Spreadsheets weren't generally used for such things as filling out forms or accounting because you just had one sheet that you were putting numbers onto, and the way of moving data from sheet to sheet was very messy. We think that with Excel's ease of use and the multiple-sheet feature, you will see a lot more people using spreadsheets for a broader set of things, such as filling out forms or doing tax work, or any sort of accounting work where you want to consolidate information without any extra keystrokes. We think that Excel will broaden the spreadsheet category, and it will increase the number of people who can see why a spreadsheet is valuable. We hope that a product such as Excel will help expand the market.

The other thing that Excel does well is show off the power of new products such as the LaserWriter. You just sit there and make one cell bold, underline some other cells, make another one italic—and the printout looks typeset. Then you really start to get a sense of how Excel can improve work for business users. Laser printers and graphics user interfaces are probably the most important things happening in personal computing. Excel will push the world in that direction much faster.

A+ also asked Lotus Chairman Mitch Kapor to answer three similar questions about Jazz, but he declined to do so. For marketing reasons, Lotus would have preferred that Jazz not be reviewed in the same article as Excel.

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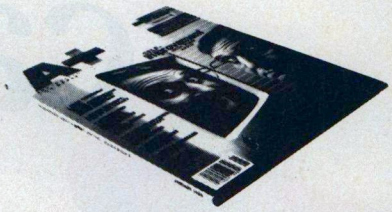

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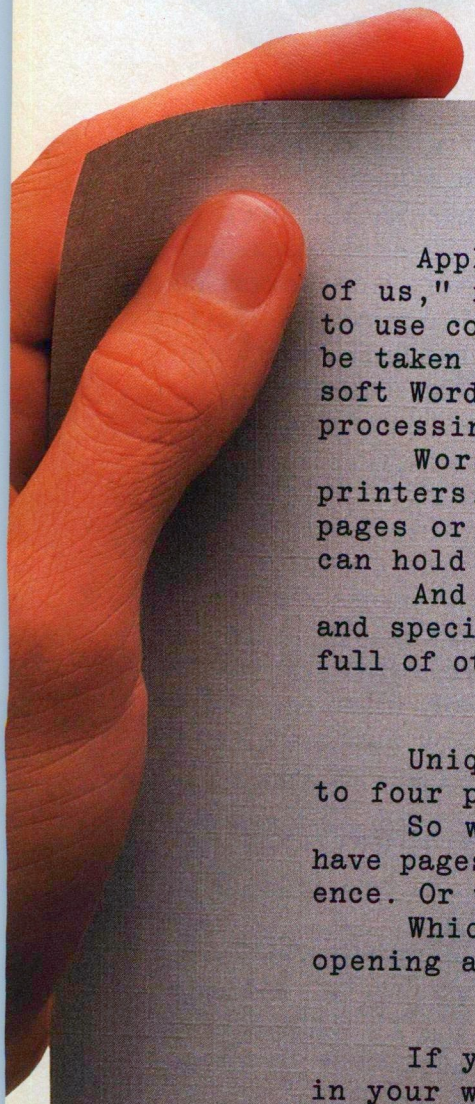

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rest of us serious writing.

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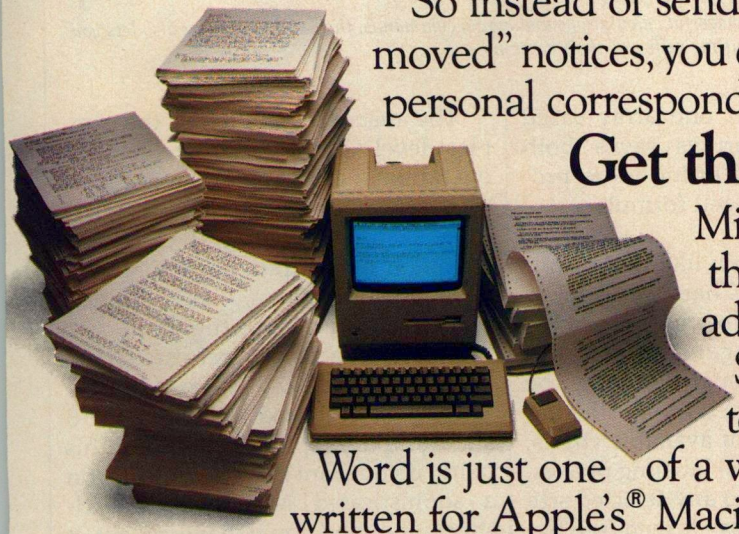

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plan package—which, as I mentioned, has garnered a good deal of critical acclaim. Excel has even more to offer with the addition of the chart-drawing functions of Microsoft's Chart, plus the macro capabilities.

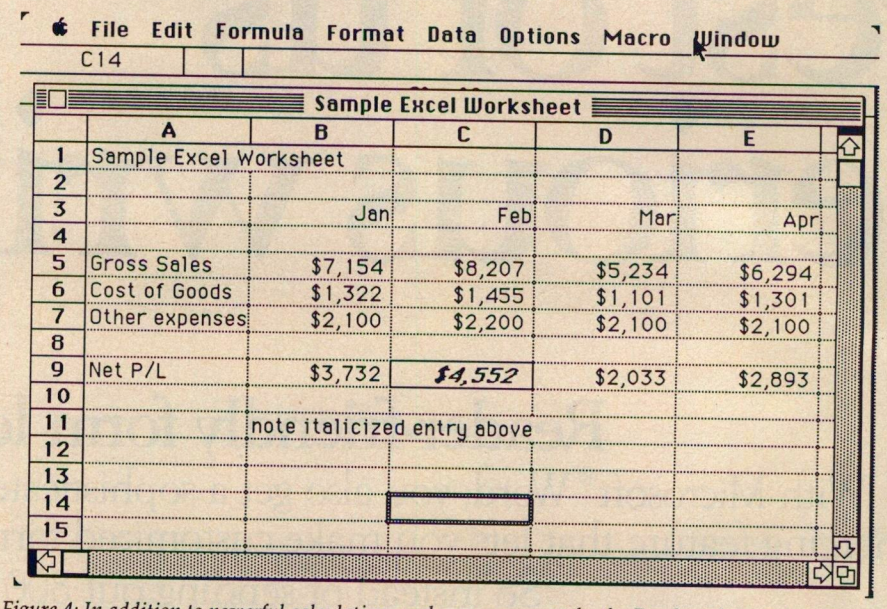
Spreadsheet

The Excel spreadsheet does most of what anyone could want from one of these row-and-column worksheets, with all the normal arithmetic, logic, and labeling capabilities (see figure 4). It's a little weak in the text department, but it does let you make simple databases right on the worksheet grid.

Again, although Excel's maximum spreadsheet size is more than 16,000 rows by 230 columns, you can use only what you can fit into the memory of a 512K Mac. If you need huge spreadsheets, however, and don't want to spring for a mainframe, Excel shares with its Multiplan ancestors the ability to read cells as needed from supplementary sheets. You can therefore use one spreadsheet to consolidate results or to supply inputs for a complete accounting system.

Interestingly, even though Jazz features the Hotview linking of spreadsheets to word processing, only Excel offers a dynamic link between spreadsheets. If you link two Excel spreadsheets together, any change in the source spreadsheet automatically carries over the next time you open the receiving chart.

Array operations are another Excel speciality. If you want to multiply one range of cells by another range and store the results in a third, you can do that in Excel with one array-based formula. Using arrays saves both time and space by fitting more processing in a single-cell formula.



	A	B	C	D	E
1	Sample Excel Worksheet				
2					
3		Jan	Feb	Mar	Apr
4					
5	Gross Sales	$7,154	$8,207	$5,234	$6,294
6	Cost of Goods	$1,322	$1,455	$1,101	$1,301
7	Other expenses	$2,100	$2,200	$2,100	$2,100
8					
9	Net P/L	$3,732	*$4,552*	$2,033	$2,893
10					
11		note italicized entry above			
12					
13					
14					
15					

Figure 4: In addition to powerful calculations and macro commands, the Excel worksheet also lets you italicize, boldface, and outline cells and their contents.

Charting

Charting in Excel, like that in Microsoft's existing Chart package, is quick and easy, although some people take longer to get the hang of it the first time through. Among the special features are sample illustrations of the types of available charts, automatic or manual labeling of axes, and scaling charts to any selected size up to a full Macintosh screen (see figure 5). Overall, most people find the Excel charts easier to use, with a wider range of selections and choices available.

The macro capability at the simplest level allows you to record your operations, give them names, and then repeat them on request. On a more complex level, you can write complete macro programs that perform computations, test values, branch, and run loops (figure 6).

Macro capability, in retrospect, has been one of the key features behind the success of the existing Lotus 1-2-3 and Symphony product lines. At this point, if you want macro capability on a sophisticated Macintosh spreadsheet, though, you'll have to get it from Excel.

Free of Bugs

Considering that the version of Excel supplied to *A+* arrived more than

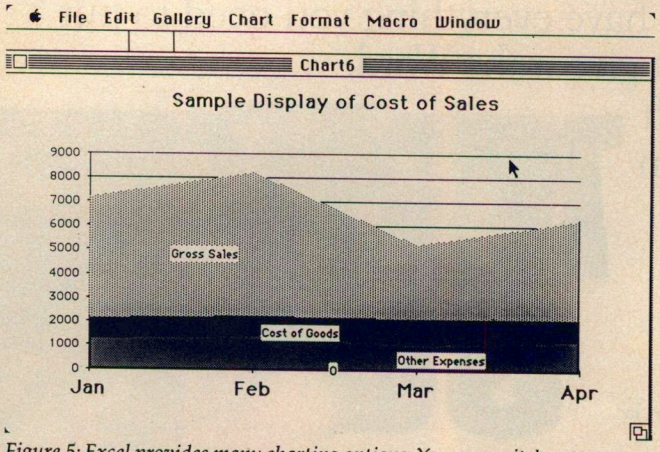


Figure 5: Excel provides many charting options. You can switch patterns or annotate your chart as in this area graph.

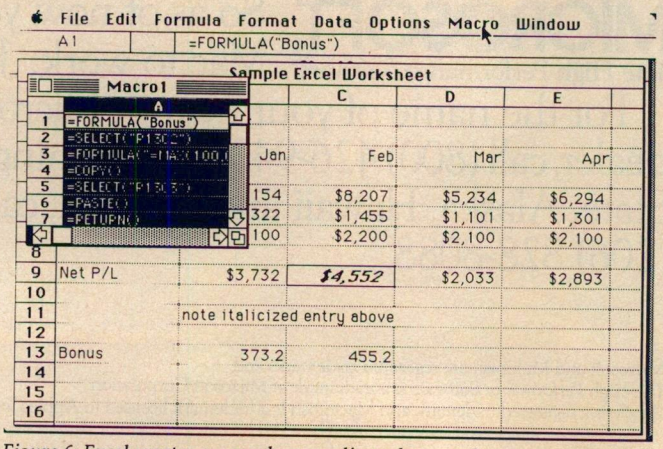


Figure 6: Excel creates macros by recording what you do, or you can create macros directly on the macro worksheet.

JAZZ&EXCEL

Using Excel's macros, you can become a spreadsheet wizard.

two months before the scheduled release date, the program seems remarkably free of obvious bugs. Help screens were not yet fully developed, and a few of the more obscure chart combinations had errors. The screen occasionally gets slightly out of sync with operations. Much of the program has not yet been optimized for speed, however, so it's too early to tell how fast it will be at recalculation.

Good Documentation

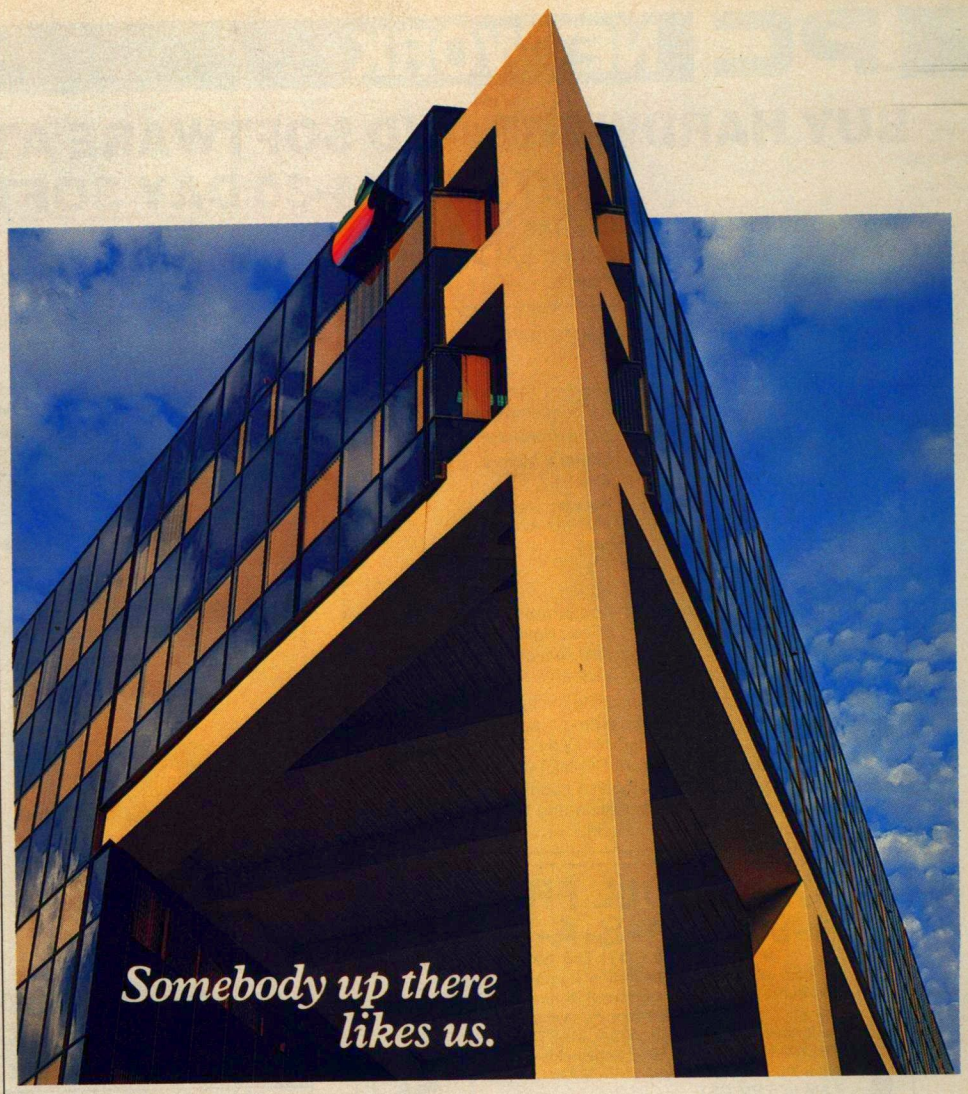
Excel also comes on two Macintosh disks, with a two-part manual. One manual, which includes a tutorial section, covers the normal operation of the spreadsheet and chart functions. A second volume covers array operations, functions, and the macro features. Although not as lavish as the Jazz documentation, the Excel manuals are well laid out, readable, and fairly complete.

Microsoft also prefers to have dealers handle users' questions, so don't be surprised by occasional long waits if you call Microsoft directly with questions (such calls are not toll-free). Since Excel wasn't publicly available when I wrote this comparison, I couldn't check on user product support for this product. My past experience with Microsoft support has been mixed. The Excel product group has been quite helpful so far.

PRODUCTS OR SOLUTIONS

If your work life isn't a constant race against the clock or the competition, you may not need either of these high-powered programs—if you already have their more modest Macintosh alternatives: Multiplan and Crunch for spreadsheets, Ensemble and Quartet for integrated packages, and other programs that are on their way to the retailers' shelves.

Furthermore, if you have the time to assemble your own package and the skill to move data back and forth through the Clipboard, you can use Apple's Switcher program to combine your own favorites (in fact, Microsoft recommends that if you want both a sophisticated spreadsheet and



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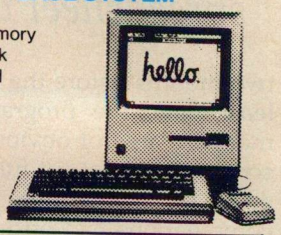

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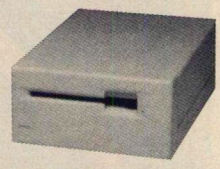

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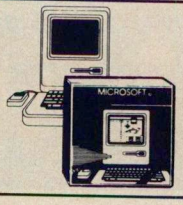

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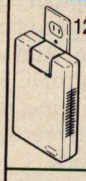

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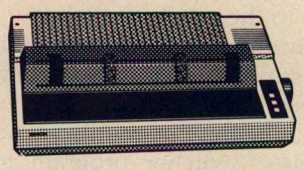

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CBS *Murder by The Dozen*	20.97*
Davidson & Associates *Speed Reader II*	37.97*
Davidson & Associates *Math Blaster*	29.97*
Davidson & Associates *Word Attack*	29.97*
Epyx *Temple of Apshai*	21.97*
Hayden *DaVinci—Houses/Interiors/ or Landscapes—Mac Only*	24.75*
Hayden *Sargon III*	25.75*
Hayden *SAT Sampler Test*	11.97*
Infocom *Deadline, Suspended*	27.00*
Infocom *Enchanter, Planet Fall, Cutthroats*	20.50*
Infocom *Zork II, Zork III*	23.50*
Infocom *Zork I, Witness*	$ 20.50*
Infocom *Suspect, Infidel, Sorceror*	25.00*
Infocom *Hitchhiker's Guide, Seastalker*	22.00*
Penquin *Graphics Magician—Mac Only*	28.97*
Penquin *Transylvania Macintosh Version Only*	20.97*
Screenplay *Professional Blackjack*	39.88*
Sierra On-Line *Frogger Mac Too!*	21.00*
Sierra On-Line *Crossfire*	18.00*
Simon & Shuster *Typing Tutor III—Mac Too!*	28.25*
Sir-Tech *Wizardry*	26.97*
Sublogic *Night Mission Pinball*	20.00*
▶ **Spinnaker** *Alphabet Zoo, Face Maker, Kinder Comp, Hey Diddle Diddle, Rhymes & Riddles, Story Machine*	15.97*
▶ **Spinnaker** *Delta Drawing*	24.97*
▶ **Spinnaker** *The Most Amazing Thing*	20.77*
Videx *MacGammon & Cribbage—Mac Only*	25.17*
Videx *MacVegas—Mac Only*	31.00*
Virtual Combinatics *Micro Cookbook*	21.00*

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(Please add $2.50 shipping and handling for each title ordered from below.)

Apple *Apple Works*	$165.00*
Assimilation Process *Mac•Tracks or Lock•It*	19.25*
ATI *How to use Multiplan*	42.00*
Borland International *Turbo Pascal*	30.00*
BPI *GL, AP, AR, PR, or INV Each Only*	205.00*
Broderbund *Bank Street Writer*	40.00*
Central Point *Copy II Plus*	20.00*
Dow Jones Software *Market Analyzer*	198.00*
Dow Jones Software *Market Manager*	103.50*
Funk Software *Sidways*	34.00*
Human Edge *Mind Prober*	26.50*
Human Edge *Management of Sales Edge*	110.00*
▶ **Living Videotext** *Think-Tank-Mac-Too!*	75.00*
▶ **Mark of the Unicorn** *Mouse Stampede*	23.97*
▶ **Microsoft** *Multiplan (DOS or CP/M)*	102.00*
▶ **Microsoft** *Word for Macintosh*	102.00*
▶ **Microsoft** *File for Macintosh*	$102.00*
▶ **Microsoft** *Multiplan for Macintosh*	102.25*
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Monogram *Dollars & Sense for Macintosh Version Only*	89.98*
Odesta *Helix for Macintosh Reg's 512K*	237.00*
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Softcraft *Fancy Fonts*	125.00*
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Apple *Apple IIc*	CALL	
Apple *Apple IIe*	CALL	
AT&T *6300 PC CPUZ 128K/2 Floppy/1 Serial/1 Parallel*	$1,575.00*	*(34.02)*
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COMPAQ *Desk Pro System with Tape Backup with/640K/1 Floppy/10MB Hard Disk/ 10MB Tape Drive/Monitor*	3,018.14*	*(65.20)*
▶ **COMPAQ** *Hard Disk Portable 256K 10MB Hard Disk/1 Floppy*	2,285.00*	*(49.35)*
▶ **IBM** *PC Base System 2DSDD/FDC/256K*	1,495.02*	*(32.55)*
▶ **IBM** *PC Professional Hard Disk 256K 1 DSDD/FDC/10MB Hard Disk*	1,886.62*	*(40.75)*
IBM *PC/AT Base System-1 2MB Floppy/256K*	3,149.00*	*(68.00)*
IBM *PC/AT All Configs*	CALL	
▶ **Sayno** *MBC 775 Color Portable IBM Clone 2 Drives/Color Monitor/256K*	1,775.00*	*(38.00)*
Texas Instruments *Professional*	CALL	

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Alps *AP-100A Dual Apple Drives in One Case*	$ 309.00*	*(7.00)*
Apple *All MODELS*	CALL	
Apple *Macintosh Add On Drive*	349.95*	*(7.50)*
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Micro-Sci *A2 143KB Drive*	165.00*	*(5.00)*
Micro-Sci *Floppy Controller*	55.00*	*(2.50)*
▶ **PC Network** *Half Height DSDD Drive—No Case*	77.50*	*(2.50)*
Rana *Elite I 163K Drive*	225.00*	*(5.00)*
Rana *Elite II 326K Drive*	320.00*	*(7.00)*
Rana *Elite III 652K Drive*	398.00*	*(10.00)*
Rana *Floppy Controller*	70.00*	*(2.50)*
Shugart *AP-50 Full Height Add-On*	155.00*	*(4.00)*
▶ **Tandon** *TM100-2 Full Height DSDD Drive Only*	93.00*	*(2.20)*
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▶ **64K Memory Upgrade Kits** *(9 chips)*	$ 6.75*	*(1.00)*
▶ **64K Dynamic Ram Chips** *(Each)*	.75*	*(1.00)*

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▶ **Anchor** *Mark XII*	230.00*	*(5.00)*
Hayes *Micromodem IIe w/Smartcom*	125.00*	*(2.50)*
Hayes *Smartmodem 300*	125.00*	*(5.00)*
Hayes *Smartmodem 1200*	355.00*	*(4.00)*
Hayes *Smartmodem 1200B with new Smartcom II/VT 100 Emulater*	317.00*	*(2.50)*
Hayes *Smartmodem 2400*	568.00*	*(6.00)*
Novation *Apple Cat II*	174.45*	*(2.50)*
Prometheus *ProModem 1200*	276.00*	*(6.00)*
▶ **Prentice** *Pop Com MAC Pack 1200 Baud Modem, Cable, Straightalk*	255.00*	*(2.50)*
U.S. Robotics *Password LOWEST PRICE 1200BPS MODEM!*	195.00*	*(4.00)*
U.S. Robotics *Courier 2400BPS Modem*	450.00*	*(5.00)*

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Amdek *Video 300G Composite Monitor*	$ 110.00*	*(3.00)*
Amdek *Video 300A Composite Monitor*	120.00*	*(3.00)*
Amdek *Video 310A IBM Type Monochrome Monitor*	130.00*	*(3.00)*
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Princeton *HX-12 RGB Monitor*	CALL	
Zenith *ZVM-123 High Res Green (Consumer Reports Rated Best Buy!!)*	76.00*	*(2.50)*

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AST *Research Multi I/O-2 Serial/Clock*	155.00*	*(2.50)*
Microsoft *Premium Softcard IIe*	243.67*	*(2.50)*
Microtek *Dumpling/GX*	55.00*	*(2.50)*
Microtek *Magnum 80me 80COL + 64K*	93.00*	*(2.50)*
Orange Micro *Grappler +*	96.90*	*(2.50)*
Orange Micro *Serial Grappler*	78.00*	*(2.50)*
PC Network *Z80 Card*	35.00*	*(2.50)*
Quadram *Multicore-1Parallel/1 Serial/Clock/ Expandable to 256K*	140.00*	*(2.50)*
Quadram *MP-8K Microfazer Buffer (expandable)*	110.00*	*(2.50)*
Quadram *APIC/G Graphics Interface*	62.00*	*(2.50)*
Quadram *eRAM-80 80COL with 64 Memory*	88.00*	*(2.50)*
Street Electronics *ECHO II Speech Synthesizer*	100.00*	*(2.50)*
Thunderware *Thunderclock*	104.00*	*(2.50)*

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Apple *8.5" Imagewriter (with Mac Kit)*	446.00*	*(9.34)*
▶ **Citizen** *MSP-10 160CPS/80COL*	245.00*	*(5.30)*
▶ **Citizen** *MSP-15 160CPS/132COL*	390.00*	*(8.43)*
▶ **Epson** *LX-80 100CPS 80COL LQ Mode*	205.00*	*(4.43)*
▶ **Epson** *FX-85 160CPS 80COL*	315.00*	*(6.80)*
▶ **Epson** *FX-185 160CPS Wide Platen*	440.00*	*(9.50)*
Epson *LQ1500 NEW LQ/IDP Printer*	CALL	
NEC *2030 20CPS Letter Quality Printer*	605.00*	*(13.00)*
NEC *3530 33CPS Letter Quality Printer*	960.00*	*(20.74)*
NEC *8810 55CPS Printer*	1,530.00*	*(33.50)*
▶ **Okidata** *ML 182 New 120CPS/LQ Mode/FRICT/ Epson Graphics*	200.00*	*(4.34)*
▶ **Okidata** *NEW! Color 20 80CPS/100 + Colors/ LQ Mode/Epson Graphics! + More (Requires Interface)*	109.00*	*(4.34)*
▶ **Okidata** *NEW! Epson Interface for Okimate Color 20*	69.00*	*(1.50)*
▶ **Okidata** *ML 192 New Sleek Design/160CPS/ LQ Mode/Fric/IBM Graphics*	325.00*	*(7.35)*
Quadram *Quadjet Multicolor Ink-Jet with Kit*	396.00*	*(8.55)*
Qume *Sprint 11/45 45 CPS Letter Quality*	1,155.00*	*(24.40)*
Qume *IBM Cable and Interface (required)*	72.00*	*(1.00)*
▶ **Star Micronics** *Power Type 180CPS Letter Quality*	300.00*	*(6.50)*
Texas Instruments *855 DP/LQ w/Tractor*	702.00*	*(15.16)*
Toshiba *P1340 80COL/144CPS*	530.00*	*(11.50)*
Toshiba *P351 New! 288CPS/132COL*	1,110.00*	*(23.98)*

ACCESSORIES AND SUPPLIES

Apple *Macintosh Carrying Case*	$74.00*	*(1.60)*
▶ **Assimilation Process** *Mac•Turbo•Touch*	79.00*	*(2.50)*
▶ **Brand Name Macintosh Diskettes** *Box of 10 Guaranteed for Life Includes free Flip & File Case*	24.95*	*(1.00)*
▶ **Brand Name SS/DD Diskettes** *(Box of 10)*	9.00*	*(1.00)*
Chalkboard *Powerpad*	62.00*	*(1.50)*
Hayes *Mach II Joystick for IIe*	25.00*	*(1.50)*
Hayes *Mach III Joystick w/Fire Button for IIe*	31.00*	*(1.50)*
Kensington Microwave *System Saver Fan*	56.97*	*(1.50)*
Koala *KoalaPad Touch Tablet*	78.00*	*(1.50)*
M & R *Sup-R-Mod RF Modulator*	44.00*	*(1.50)*
PC Network *Cooling Fan with Surge Protector & Dual Outlets*	25.00*	*(2.50)*
Sony *Mac Diskettes (Box of 10)*	24.50*	*(1.00)*
Thunderware *Thunderscan Optical Digitizer No Expensive Camera Equipment Needed!!*	155.00*	*(2.50)*
WP Printer Paper *2600 Sheets Microfine Perfs*	17.00*	*(10.00)*

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10 SPECIAL SAVINGS BULLETINS—THE PRINTOUT—Issued Quarterly at no charge to Network members only! The Printout contains all the New Product listings and price changes you need to keep your Catalog up to date. Also, we buy excess dealer inventories, and store bankruptcy closeouts, which we turn around and make available to our members at fantastic savings via *THE PRINTOUT.*

11 DISCOUNT BOOK LIBRARY—Working with numerous publishers and distributors, The NETWORK has assembled a library of over 1000 computer related books and manuals at savings of up to 75% from the normal store price.

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13 CORPORATE ACCOUNT PROGRAM—Almost 50% of The NETWORK's members are corporate buyers and users *(see opposite page left).* The NETWORK can establish open account status and assign designated account managers to expedite orders, and coordinate multiple location shipments.

14 QUANTITY DISCOUNTS—For large corporations, clubs, and repeat or quantity buyers The NETWORK can extend additional single order discounts, when available to us from our manufacturers and distributors.

15 PRICE PROTECTION—The PC Industry is crazy!! Prices change not yearly or monthly or even weekly but often day by day! These changes are sometimes up *but are mostly down!!!* **THE NETWORK GUARANTEES THAT IN THE EVENT OF A PRODUCT PRICE REDUCTION, BETWEEN THE TIME YOU PLACE YOUR ORDER AND THE TIME THE PRODUCT SHIPS YOU WILL ONLY PAY THE LOWER AMOUNT!!**

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JAZZ & EXCEL

Neither Jazz nor Excel is currently a complete solution.

word-processing program, you combine Excel with Microsoft Word using Switcher).

Neither Jazz nor Excel is currently a complete solution. Jazz needs most notably a better solution for macros than running it with a record-and-playback program such as Assimilation's Mouse Tracks. Excel needs a better way of getting the results into memos than using Switcher and Word. Both need a way of producing color graphics for presentations.

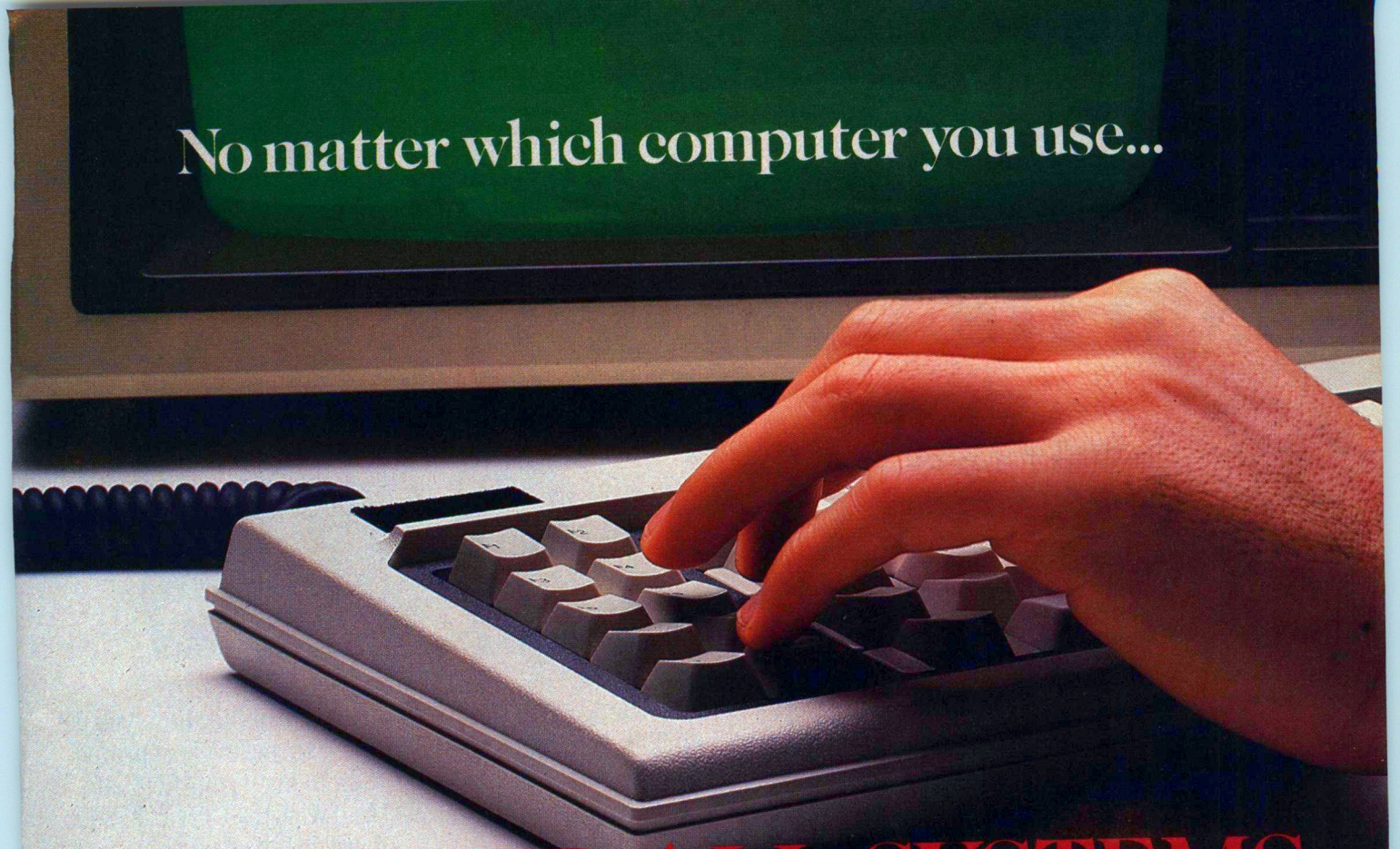
On the other hand, for users who are in middle management or the professions, or are small-business owners, saving fifteen minutes a day can pay for either of these packages in less than a year. Information workers, like carpenters or farmers, need power tools to keep up with the market. Using Excel's macros, it's possible to become a spreadsheet wizard. With Jazz, you could become a one-person management-information service.

In the long run, it's not the intrinsic worth of the software itself, but the whole complex of software, training, add-on products, and updates that determines the value of a purchase. Start-up companies are dynamic and exciting, but many corporate buyers would rather deal with the more established firms. Lotus and Microsoft are as stable and capable as any firms in the industry, and their efforts should insure a sufficient user base for the complementary products and services to appear.

Consider Your Needs

It's not all that clear-cut, is it? For most types of small businesses or for a nonfinance professional without a current collection of business software, my choice right now is Jazz. If I worked with numbers all day, I'd get Excel for its macros. If I worked in middle management, I might ask for both—Jazz for everyday use and Excel for consolidating budgets.

Considering that I already have a range of Macintosh programs, would I spend several hundred dollars for



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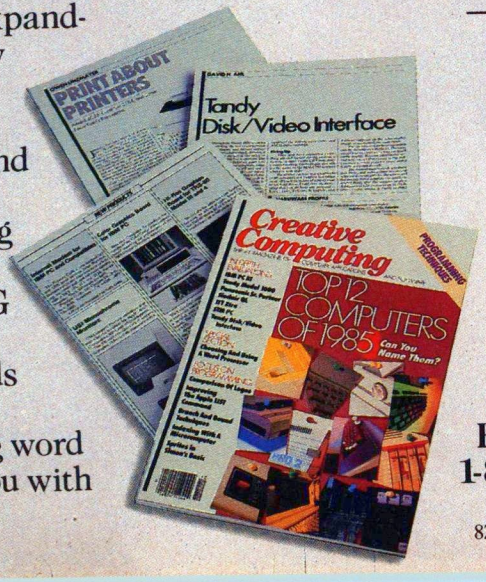

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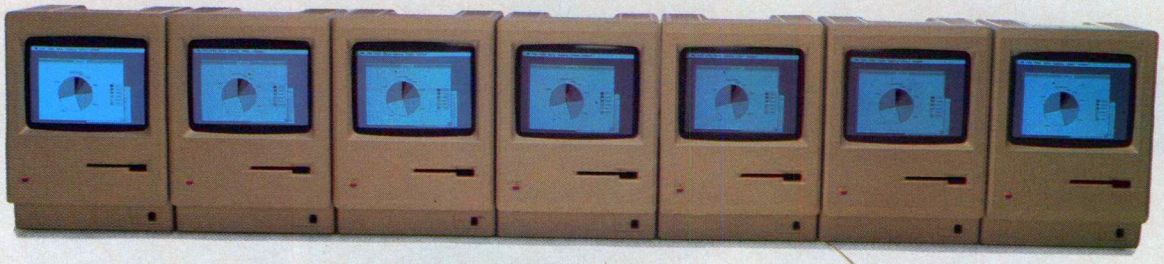

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Because you'll still have to share data by swapping floppies.

And just consider how fast a floppy disk fills up with an entire workgroup compiling data. To share information, you have to get those floppies neatly stacked, sorted and cataloged.

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Which is why we've introduced OmniTalk software. It lets you network your Macintosh Office and LaserWriter printer with an OmniDrive hard disk. So you can store all your files in one place. And share information whenever you want, with whomever you want.

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JAZZ & EXCEL

increased capabilities? Only if doing so would add to my income or reduce my frustration. Good software, like good tools, should be an investment. Like any investment, it must make more sense than the alternatives. I could get along fine with my existing Switcher, MacWrite, any spreadsheet, and Microsoft Chart. In many lines of work, however, the time saved in training staff to use an integrated program rather than several individual products would pay back its cost several times over.

Since these programs serve somewhat different needs, and because alternatives exist for either of them, I advise you to compare each program to your own list of jobs that need doing. If either choice looks worthwhile, take your task list into a dealer and ask for a demonstration. Even though you're almost always better off buying standard software, rather than writing your own, a decision involving a purchase of several hundred dollars still deserves some custom consideration. ✚

Steve Rosenthal plays keyboards for A+ as a Consulting Editor and frequent contributor.

PRODUCT INFORMATION

Jazz
Lotus Development Corporation
161 First Street
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CIRCLE 450 ON READER SERVICE CARD

Excel
Microsoft
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Mitsuba Drive for Mac 259

GENERIC HARDWARE
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CIRCLE 115 ON READER SERVICE CARD

A COMPARISON OF BUSINESS SOFTWARE

BY J. SANBORN HODGKINS AND CHIP CARMAN

GENERAL	NOTES	JAZZ	FOR IBM PC SYMPHONY	EXCEL	CRUNCH	FOR IBM PC 1-2-3
PRICE		$595	$695	$395	$295	$495
MACRO CAPABILITY	1		■	■		■
ON-LINE HELP			■	■	■	■
NUMBER OF PACKAGE DISKS		6	6	2	1	5
CELL DESIGNATIONS		A1	A1	A1 OR R1C1	A1	A1
ASSIGN NAME TO CELLS OR CELL RANGES		■	■	■	■	■
HIDE DATA		■		■	■	
DELETION RECOVERY (UNDO)		■		■	■	
COPY-PROTECTED		■	■	■		■
WINDOWS						
MAXIMUM NUMBER OF WINDOWS		8	LIMITED BY MEMORY	LIMITED BY MEMORY	13	2
CHANGE WINDOW SIZE		■	■	■	■	
MULTIPLE WINDOWS WITHIN SAME FILE			■	■	■	■
MULTIPLE FILES WITHIN SAME APPLICATION		■	■	■		
DATA TRANSFER						
TEXT FILE<->SPREADSHEET	2	■	■	N/A	N/A	N/A
TEXT FILE<->DATABASE	2	■	■	N/A	N/A	N/A
GRAPH ->TEXT FILE	2	■	■	N/A	N/A	N/A
TEXT FILE<->TELECOMMUNICATION		■	■	N/A	N/A	N/A
SPREADSHEET<->DATABASE		■	■	■	■	■
SPREADSHEET->GRAPH		■	■	■	■	■
SPREADSHEET->TELECOMMUNICATION	3	■	■	N/A	N/A	N/A
DATABASE ->GRAPH		■	■	■	■	■
DATABASE ->TELECOMMUNICATION		■	■	N/A	N/A	N/A
DATA IMPORT AND DATA EXPORT	4					
TEXT		READ/WRITE	READ/WRITE	READ/WRITE	READ/WRITE	READ/WRITE
SYLK	5	N/A	N/A	READ/WRITE	READ ONLY	N/A
DIF		N/A	READ/WRITE	N/A	READ/WRITE	READ/WRITE
DB FILES (dBASE)		N/A	READ/WRITE	N/A	READ/WRITE	READ/WRITE
.WKS (1-2-3)		READ ONLY	READ/WRITE	READ/WRITE	N/A	READ/WRITE
SPREADSHEET						
NUMBER OF ROWS		8192	8192	16,384	9999	2048
NUMBER OF COLUMNS		256	256	230	250	256
MAXIMUM CELL WIDTH		254	240	255	250	72
NUMBER OF NUMERIC FORMATS		11	6	USER DEFINABLE	24	5
FREEZE ROWS OR COLUMNS FOR TITLE		■	■	■	■	■
SEARCH				■	■	
RELATIVE/ABSOLUTE CELL REFERENCES		■	■	■	■	■
COLUMN SORT		■		■	■	
PROTECT CELLS		■	■	■	■	■
STORES BLANK CELLS TO MEMORY	6	■	■	■		■
ARRAY OPERATIONS				■		
ACTIVELY LINKED SPREADSHEET FILES				■	■	
AUTOMATIC RECALCULATION		■	■	■	■	■
MANUAL RECALCULATION OPTION		■	■	■	■	■
NATURAL-ORDER CALCULATION		■	■	■	■	■
SELECTIVE CALCULATION				■		
NUMBER OF MATH FUNCTIONS		15	17	11	16	17
NUMBER OF TRIG FUNCTIONS (MATH)		7	7	7	8	8
NUMBER OF COND. FUNCTIONS		9	7	10	12	5
NUMBER OF FINANCIAL CALCULATIONS		5	5	8	9	5
NUMBER OF STATISTICAL FUNCTIONS		7	7	11	12	7
NUMBER OF SPECIAL FUNCTIONS		11	10	15	11	5
NUMBER OF DATABASE FUNCTIONS		16	7	14	USER DEFINABLE	7
NUMBER OF TEXT FUNCTIONS		17	NONE	7	NONE	NONE
SUBSTRING OPERATIONS		■	■	NONE	NONE	NONE
DATE CALCULATIONS		■	■	■	■	■
NUMBER OF DATE FORMATS		11	5	USER DEFINABLE	8	3
LOOKUP TABLES		■	■	■	■	■
TRANSPOSE ROWS TO COLUMNS		■	■	■		
REFERENCE OTHER SPREADSHEETS			■	■		■
DISPLAY FORMULAS IN CELLS		■	■	■	■	■

NOTES (KEYED TO NUMBERS IN COLUMN 2, ABOVE) **1.** Excel's Record feature builds macros based on your keystrokes. **2.** Jazz's Hotview feature links tables, charts, and database records to a text file. **3.** New versions of 1-2-3 and Symphony will have menu options for converting spreadsheet data to and from Jazz. **4.** Excel directly reads Multiplan binary and Chart files. **5.** Jazz's version 1.0 SYLK file-conversion routines did not work. **6.** Crunch allocates space only for cells in use. **7.** Crunch offers three chart sizes. **8.** Lotus 1-2-3 displays percentage values only for pie slices. **9.** Excel will generate the chart title and axes' label based on the data selected. With the Lotus products, you must specify the cells that contain these entries. **10.** Crunch's Note Window holds up to two-and-a-half

The following chart compares the features of three of the significant new business-software packages for the Macintosh with their counterparts for the IBM PC.

Jazz, the integrated word-processing, database, spreadsheet, graphics, and telecommunications program for the Mac from Lotus is compared with Symphony, another Lotus program that performs a group of similar functions on the IBM PC.

The chart also compares Microsoft's Excel and Paladin's Crunch for the Mac with Lotus' extremely popular 1-2-3 program for the IBM PC. All three of these programs are number-processing programs that contain a spreadsheet, an on-sheet database, and the capability to create graphic representations of information on the spreadsheet.

CHART	NOTES	JAZZ	FOR IBM PC SYMPHONY	EXCEL	CRUNCH	FOR IBM PC 1-2-3
SAVE SEPARATE CHART FILE		■	■	■	■	■
PIES		■	■	■	■	■
BARS		■	■	■	■	■
LINES		■	■	■	■	■
AREA		■		■	■	
SCATTER		■		■		
PERCENT		■		■	■	
COMBINATIONS		■		■		
ADD TEXT AND ARROWS		■		■		
CHANGE FILL OR COLOR FOR BARS		■	■	■	■	■
CHANGE FILL OR COLOR FOR PIES		■	■	■	■	
CHANGE CHART SIZES	7	■	■	■	■	■
CHANGE FONT SIZES		■	■	■		■
CHANGE FONT TYPES		■	■	■		■
COLOR PLOTTER			■			■
REARRANGE CHART ELEMENT		■		■		
CHANGE CHART ELEMENT SIZES		■		■		
EXPLODED PIES		■	■	■		
MAXIMUM NUMBER OF DATA ELEMENTS		8192	8192	101	100	2048
SHOW ACTUAL VALUES FOR PIE SLICES	8	■	■	■		
NUMBER OF DATA SETS PER GRAPH		UNLIMITED	6	UNLIMITED	10	6
NUMBER OF LINE MARKER SYMBOLS		14	6	9	10	6
USER CAN POSITION LEGEND/TITLE		■		■		
CHOOSE CHART TYPE IN GALLERY				■		
AUTOMATIC LEGENDS & TITLES OPTION	9			■	■	
WORD PROCESSING	10					
AUTOMATIC BACKUP				N/A	N/A	N/A
MENU-DRIVEN		■	■	N/A	N/A	N/A
MAIL-MERGE FUNCTION		■	■	N/A	N/A	N/A
CHANGE TOP AND BOTTOM MARGINS	11	■	■	N/A	N/A	N/A
VARIABLE PARAGRAPH FORMATS		■	■	N/A	N/A	N/A
JUSTIFY SIDE MARGINS		■	■	N/A	N/A	N/A
AUTOMATIC REFORMATTING		■		N/A	N/A	N/A
COPY BETWEEN FILES		■		N/A	N/A	N/A
READ IN TEXT FROM ANOTHER FILE	12		■	N/A	N/A	N/A
DYNAMIC LINKING TO DATA FILES	2	■	■	N/A	N/A	N/A
COPY AND MOVE COLUMNS			■	N/A	N/A	N/A
TYPESTYLE OPTIONS		■	■	N/A	N/A	N/A
CHANGE FONT STYLES		■	■	N/A	N/A	N/A
CHANGE FONT SIZES		■	■	N/A	N/A	N/A
TEXT SEARCH		■	■	N/A	N/A	N/A
SEARCH AND REPLACE		■	■	N/A	N/A	N/A
PARTIAL-WORD SEARCH		■		N/A	N/A	N/A
HEADER LINES	13	■	■	N/A	N/A	N/A
FOOTER LINES	13	■	■	N/A	N/A	N/A
AUTOMATIC PAGE NUMBERING		■	■	N/A	N/A	N/A
TEXT VARIABLES		■	■	N/A	N/A	N/A
DATABASE						
MAXIMUM RECORDS PER FILE	14	8000	8191	16,384	8000	2048
MAXIMUM FIELDS PER RECORD		100	32	230	250	256
MAXIMUM CHARACTERS PER FIELD		254	240	72	128	256
DATA-ENTRY FORM		■	■			
REARRANGE FIELDS ON A FORM		■	■			
MAXIMUM NUMBER OF SORT FIELDS		3	3	3	1	2
SEARCH AND QUERY		■	■	■	■	■
EXTRACT		■	■	■	■	■
ADD FIELDS		■	■	■	■	
ENTER CALCULATIONS IN FIELDS		■	■	■	■	
TABLE LOOKUP		■	■	■	■	■
DUPLICATE CHECKING IN MERGES		■	■	■		
SYSTEM DATE AND TIME		■	■	■	■	
TELECOMMUNICATIONS						
STORE NUMBER FOR AUTO-DIAL		■		N/A	N/A	N/A
STORE AUTO LOG-ON PROCEDURE			■	N/A	N/A	N/A
BAUD RATES		300-57,600	110-9600	N/A	N/A	N/A
TERMINAL EMULATION (VT100, VT52)		■		N/A	N/A	N/A

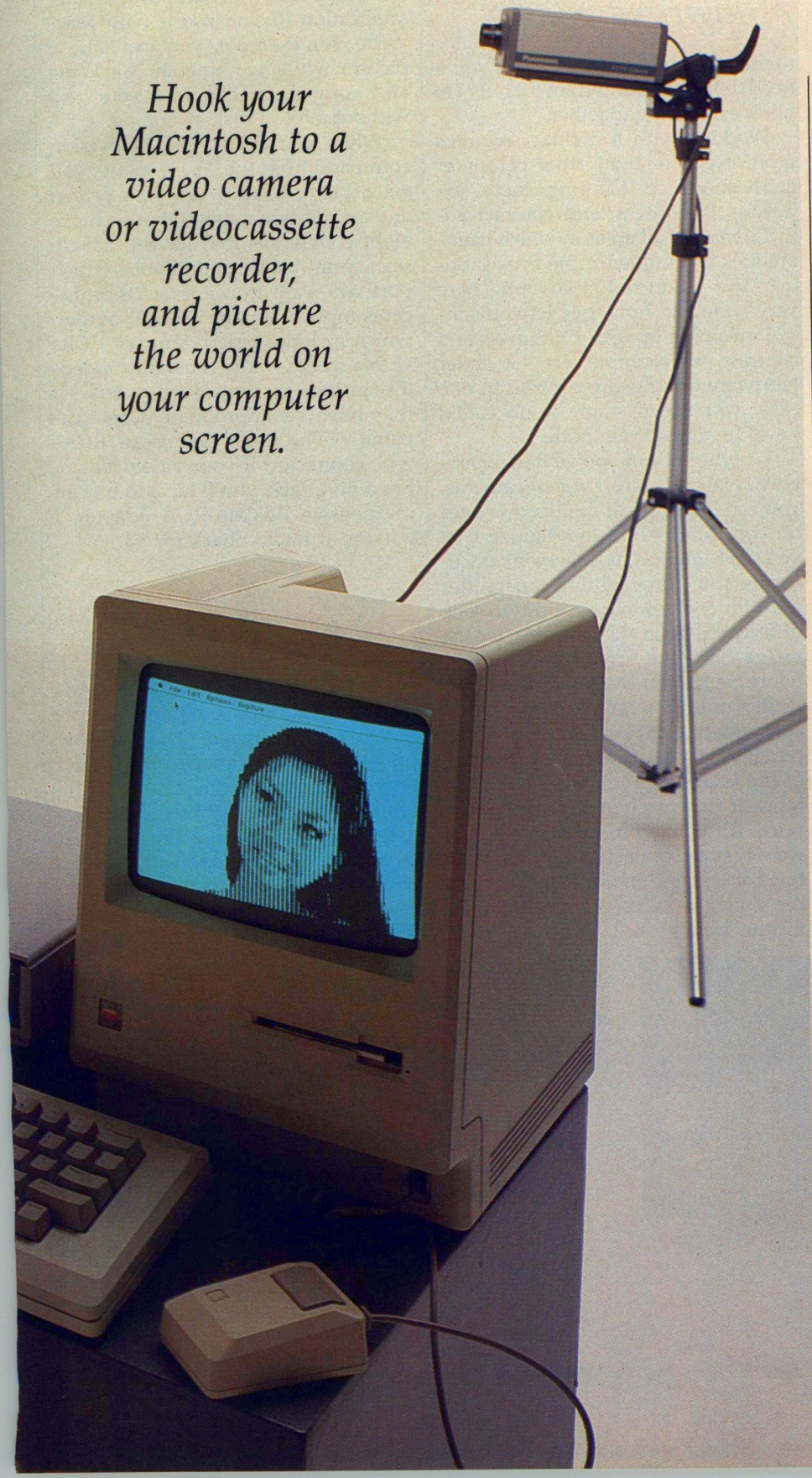
8½×11-inch letters. **11.** You can adjust top and bottom margins in Jazz by adding blank lines to the header and footer. **12.** You can read text into a Symphony file from another file without opening the source file. In Jazz, you can open one file, select text to be copied, and then open another file and paste the text in. **13.** Jazz headers and footers can have more than one line of text; Symphony allows one-line headers and footers. **14.** Crunch is memory dependent; the maximum number of records per file depends on the number of cells in the worksheet.

HARDWARE/SOFTWARE/*BY SUE CRISSMAN*

Lights, Camera, Macintosh

The Micro-Imager from Servidyne is available with Panasonic black-and-white video camera and nine-inch monitor.

Hook your Macintosh to a video camera or videocassette recorder, and picture the world on your computer screen.



The Macintosh contains some of the most advanced graphics capabilities of any personal computer. It uses graphics to create an exceptionally easy-to-read video display that can mix graphics with text in many typefaces, typestyles, and type sizes. MacPaint, MacDraw, Video Works, and many other programs make special use of the Mac's advanced graphics, manipulating images in a variety of ways to achieve results that can be spectacular.

Because the Macintosh allows you to manipulate graphic images easily, several companies have produced devices that allow you to capture images from the outside world (such as drawings, diagrams, and photographs) and use them with the Macintosh. Last month I told you about one of these devices, ThunderScan (see "ThunderScan," *A+*, August 1985, pages 138–143). This month I will discuss five video digitizers.

Video digitizers work with a standard video signal, so you can use them to hook a Macintosh up to most brands of video cameras and videocassette recorders (VCRs). Although ThunderScan operates at a higher resolution than video digitizers do, digitizers are much faster at capturing

LOWELL MARTINSON PHOTOGRAPHY

images. They are more versatile, too, since you can use them to take pictures with a video camera or to capture images from TV or videotapes.

Unlike a regular camera, which reproduces an analog representation of an image, a digitizer "looks" at an image and notes exactly where each dot

that creates the picture is and how dark or light that dot is. If the dots are small enough, they are easy to shape to represent a variety of forms and patterns. Macintosh pixels are square (as you can see when you use FatBits), yet you can draw a reasonably smooth circle on the screen.

Another way your eye gets fooled is that when you look at a Mac screen, you see black, white, and different shades of gray, yet the actual dots are only black or white. This illusion comes from perceiving different densities of tiny black and white dots as different shades of gray. Digitizers examine an image and note where the black and white dots should appear, adding different patterns to create shading. This procedure works even if the picture you're digitizing is not made up of dots. Thus, you can take a picture of a straight line you've drawn with a pen and digitize it.

Given the excellent graphics capabilities of the Mac, the arrival of several digitizers on the scene comes as no surprise. ThunderScan, the device I discussed last month, scans flat pictures and digitizes them. The five digitizers I describe in this article let you take pictures with a video camera. First, a few comments about what the products have in common.

In order to digitize an image to your Macintosh screen, you need an input device: usually a video camera, but you can use a videocassette recorder (VCR) or videodisc in some cases. The products comprise the actual digitizing unit and the software to make it work. In some cases, you'll need to buy cables and/or adapters to hook everything together.

Whether or not you've had experience working with video cameras, you can create great digitized images.

Working with a digitizer requires more expertise than other computer applications do. Lighting, focus, exposure, brightness, and contrast adjustments are all areas in which users' abilities can influence the final product. The products I'm covering here vary widely in how they let you control incoming images. Brightness and contrast, for example, can be under hardware or software control. In one case, you use a single knob called Level to adjust them both.

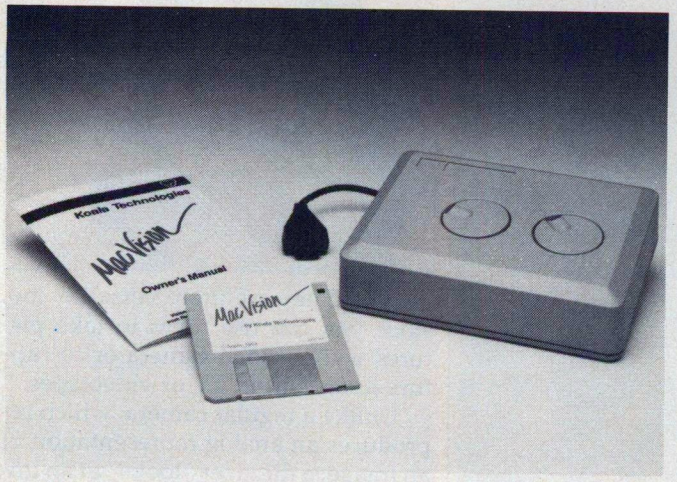
Whether or not you've had experience working with video cameras, you can create great digitized images on your Mac. All of the digitizers let you save images as MacPaint documents; thus, final editing capabilities are a function of that application. The differences lie in the way you get the image onto the screen and the enhancements you can add with a particular digitizer application. Other considerations to keep in mind when purchasing a digitizer include the size of the image it produces; the kind of input it can receive; and, of course, price. All of the products I looked at were easy to connect and set up. With this background in mind, let's look at the major features of five digitizers for the Macintosh.

MacVision

MacVision is the least complex of the five. The hardware unit has two knobs for adjusting contrast and brightness, and the software comes as a desk accessory that you install on the Macintosh System disk. Although you'll probably want to install it on a MacPaint disk, you can put it on any application. If you use it with MacWrite, for example, you can take a picture while working in MacWrite and copy it directly into your text without a lot of disk swapping.

When you choose the MacVision command from the Apple menu, you get a blank window on your screen and an additional menu that includes eight commands that let you adjust, scan, print, save, and choose which port you want to use. MacVision accepts input from any RS-170 output, which includes video cameras, VCRs with a freeze-frame capability, videodisc players, and other computers—if they have the appropriate output capability. The input jack is an RCA-type connector; if your video camera has a BNC jack, you'll have to buy an inexpensive BNC-to-RCA adapter. I got one at Radio Shack for $2.

You use the Adjust command to make initial adjustments of the image. The window presents a digital image of a jagged line running down the center of the screen. Using the knobs on the digitizer, you adjust these lines so that they just touch the outer edges of the window. Once you do an actual scan, you can adjust your camera focus and fine-tune the brightness and contrast.



MacVision, from Koala Technologies

Magic, from New Image Technology

It takes about five seconds for the entire scanned image to appear in the window, and you can adjust during the scanning process.

As you adjust, changes are reflected on the screen as the image is continuously recreated from left to right. Any adjustments you make will appear instantly on your Macintosh screen. You can stop the scan by clicking the mouse button. You can also scan a window that fills the whole screen, but that process takes about 22 seconds. Although it takes longer than working with the smaller window, I liked using the full-screen window and being able to see adjustments across the entire picture. Once you have your image the way you want it, you can print either the window or the entire screen with menu commands. Of course, you can also save it to disk. I found it extremely easy to get high-quality pictures with MacVision.

MicronEye

The good news about MicronEye is that it is a complete system. The product includes an IS32 OpticRam, lens, and tripod, in addition to the digitizer, software, and manual. You don't need an additional video camera; the OpticRam and lens capture the image for you. The entire package weighs 2½ pounds.

You set the focus with the video camera and set exposure with the camera or the software. The camera comes as part of the system, thus giving every user the same camera. Since I'm not a camera buff, I found the focus/exposure-setting procedure difficult, and I would have appreciated more tips in the manual—it does have some good information on lighting, though. The Focus Adjust command takes a reduced-resolution picture and displays it continuously on the screen so you can see results of the adjustments you make with the camera. The digitizer itself has no controls. MicronEye lets you take three kinds of pictures. The Snapshot command takes a single exposure. Gray Scale and Pseudo-Gray Scale take more than one picture and combine them into shaded pictures. MicronEye lets you invert the image to change black to white and vice versa.

MicronEye's least-lovable feature is the size of the image produced. Pictures are about as wide as the Mac screen, but they are only half as high. A menu command lets you choose whether to have your image created on the upper or lower half of the screen. To create a picture the size of a Mac screen, you have to take two pictures and paste them together—a real hassle, as far as I'm concerned.

Mac Private Eye

The most unusual aspect of Mac Private Eye, which is billed as a "video image processor," is that it can capture images that are not stationary. Like other digitizers, Private Eye accepts input from video cameras, VCRs, and videodiscs, but you do not have to freeze the frame before capturing an image. This product can grab a video frame in 1/30 of a second and store it in a buffer until it appears on your screen. Another plus is that you can create a larger image than you can with any of the other digitizers I looked at. Final printed images are about seven inches square, which is larger than your Mac screen.

To use Mac Private Eye, you first

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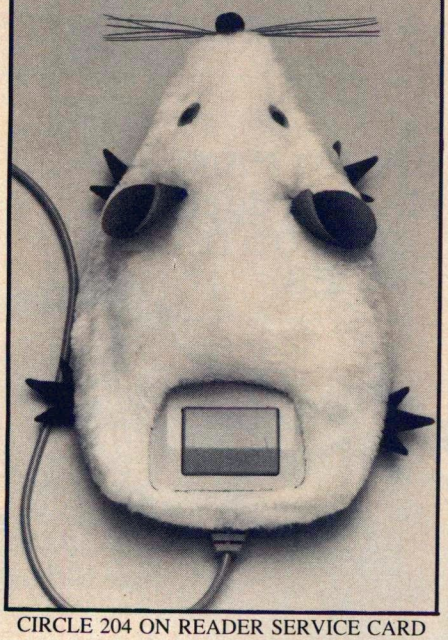

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choose Focus from the Picture menu. The product includes a focus card, as well as tips on how to focus. The single control, the Level knob, affects both brightness and contrast control. The screen is constantly updated while you are adjusting, and you don't need an external monitor, although a jack that comes in the package lets you use one if you want to. Once you've focused, you get the final product by choosing Take from the Picture menu. Three other commands, Lighten, Darken, and Decrease Contrast, help enhance image quality.

The thing I miss most with Private Eye is a Print command. In order to print an image, you must first save it in MacPaint. Although creating the image is fairly easy, I don't like having to go through the extra steps to print. The product does include a Transfer menu, which allows you to run other applications without having to return to the Finder. I found it fairly easy to get good images quickly.

Micro-Imager

Although you can use the Micro-Imager without an external monitor, its manufacturer, Servidyne, recommends that you use one if you don't want to make multiple scans to see the results of your adjustments. Capturing a two-shade image takes about five seconds, but capturing a multi-shade image can take much longer. A Panasonic TR930 black-and-white monitor is available from Servidyne, as is a Panasonic 1410 black-and-white video camera. The Micro-Imager accepts input from video cameras, VCRs, and videodiscs. One feature unique to this product is the inclusion of a black-and-white/color-filter switch on the digitizer itself. A color-rejection filter improves the quality of images you make from originals in color; you can turn the filter off for working with black-and-white images.

This product has the best documentation of all the digitizers I looked at; a Getting Started section tells you how to start taking pictures immediately, and further hints on fine-tuning follow. With a monitor, you simply focus the video camera manually until the image is clear. The manual also gives you tips on working with brightness and contrast. You can capture images in a two-shade mode for line drawings and in multi-shade modes for shaded pictures. The Mutli-Shade-Pattern mode contains six gray levels, including black and white.

A standard pattern set serves as the default, and five other pattern sets are available. In addition, you can create custom patterns with the Define Patterns command. This range of choices gives you much more control over images than do products that simply provide the gray-shade information for you. An additional feature I really like is the inclusion of a selection rectangle. The Print Selection Only command lets you print selected portions of your image. You can also use menu commands to clear the area either inside or outside the rectangle. This option is useful for getting rid of the picture

MicronEye, from Micron Technology, Inc.

of your table around the edge of the picture you just took.

The images you print with the Micro-Imager are the size of a Mac screen. The combination of an external monitor and well-written documentation make creating images with the Micro-Imager relatively simple.

Magic

Because Magic contains so many features, a first glance at the control window may be intimidating. The digitizer itself has no controls; you do everything with the software. Further, you'll notice the lack of pull-down menus; all commands are readily available all the time. The manual sketches out the window and lists the 34 places you can click to make things happen. The original version of Magic I received had only 28, but the product was still being upgraded. Only a sketchy preliminary manual was available, but if the final documentation is anywhere near as good as the software, you won't have any problems with it.

Frankly, once I got over being intimidated, I was in love with Magic. You can purchase the product with or without a video camera, and a video-output jack is available for video monitoring, although you don't need an external monitor to get quick results. Magic accepts input from video cameras, VCRs, and videodiscs. If your camera has a BNC connector, you'll need an adapter to connect it with the Magic digitizer.

Obviously, it will take you longer to learn to use a product that has 34 commands than it does to learn one that only has 6 menu items. You focus with the mouse and control brightness and contrast with sliding bars at the bottom of the screen. Since Magic can display 2.5 images per second, you see results quickly, and fine-tuning is fast and easy. You can capture images in black and white or in various levels of gray, the shades of which are completely under your control. Thirty-eight different patterns are available, and you can choose which patterns to use and how they blend together. Changes in patterns show up almost instantly on the screen. Once you start playing around with the patterns, you won't be able to stop.

Magic's maker, New Image Technology, has kept users in mind when it developed its product. It is the only one of the five products that lets you move your image around on the screen. Vertical and horizontal pan controls let you place the image exactly where you want it. Even better, you can change the size of the image. You have a choice of printing a full-size Mac screen or a smaller version. Images can also be reduced or enlarged, and using the Shift key will preserve the aspect ratio, which means that enlarged or reduced versions of the image will not be distorted. Rulers are available that let you create the exact size you desire. You type an I to invert your image, and an R reverses the image from right to left—handy for printing T-shirts. These are just a few

Micro-Imager, from Servidyne Micro Systems, Inc.

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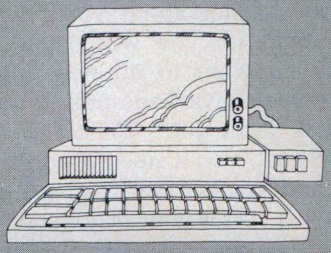

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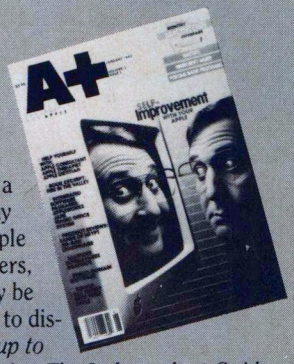

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of Magic's features. I found getting good images with Magic to be a fairly easy process. Although you have a lot to learn with Magic, it's well worth the trouble.

Weighing the Alternatives

Your decision about which digitizer is right for you will depend on what you want to do with it, and there are always trade-offs. If taking pictures from your TV set is your prime goal, you'll need Mac Private Eye, and you'll have to spend more money. If cost is your major consideration and you don't already have a video camera, you may want to choose the MicronEye and live with the problem of smaller pictures. If price is a factor, you may also have to eliminate the Micro-Imager, since it works best with an additional external monitor; the monitor does, however, make the process easier, and the Micro-Imager has more pattern-enhancement capabilities than most products. If you just want to grab pictures without a lot of work, MacVision can do the job. If I were going to buy a digitizer, however, I'd buy Magic, because it has so many features. The final choice is yours. Happy digitizing. ✚

Sue Crissman is a San Francisco Bay Area writer, consultant, and contributing editor to A+. Her clients include Apple and other computer companies for which she designs and writes training, sales, and promotional materials.

PRODUCT INFORMATION

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I/O Video, Inc.
225 Third Street
Cambridge, MA 02142
(617) 547-4141
List Price: $595
Requires: Video source
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MacVision
Koala Technologies Corporation
3100 Patrick Henry Drive
Santa Clara, CA 95052-8100
(408) 986-8866
List Price: $399.95
Requires: Video source
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Magic
New Image Technology
10300 Greenbelt Road
Suite 104
Seabrook, MD 20706
(301) 464-3100
List Price: $399; Magic with camera, $549; Micro Nikkor f2.8 55mm lens with C-mount adapter, $225
Requires: Video source
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Micro-Imager
Servidyne Micro Systems, Inc.
P.O. Box 93846
1735 DeFoor Place NW
Atlanta, GA 30377
(404) 352-2050
List Price: $349.95; Panasonic 1410 black-and-white video camera, $175; Panasonic TR930 black-and-white nine-inch monitor, $150
Requires: Video source; video monitor recommended
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MicronEye
Micron Technology, Inc.
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1447 Tyrell Lane
Boise, ID 83706
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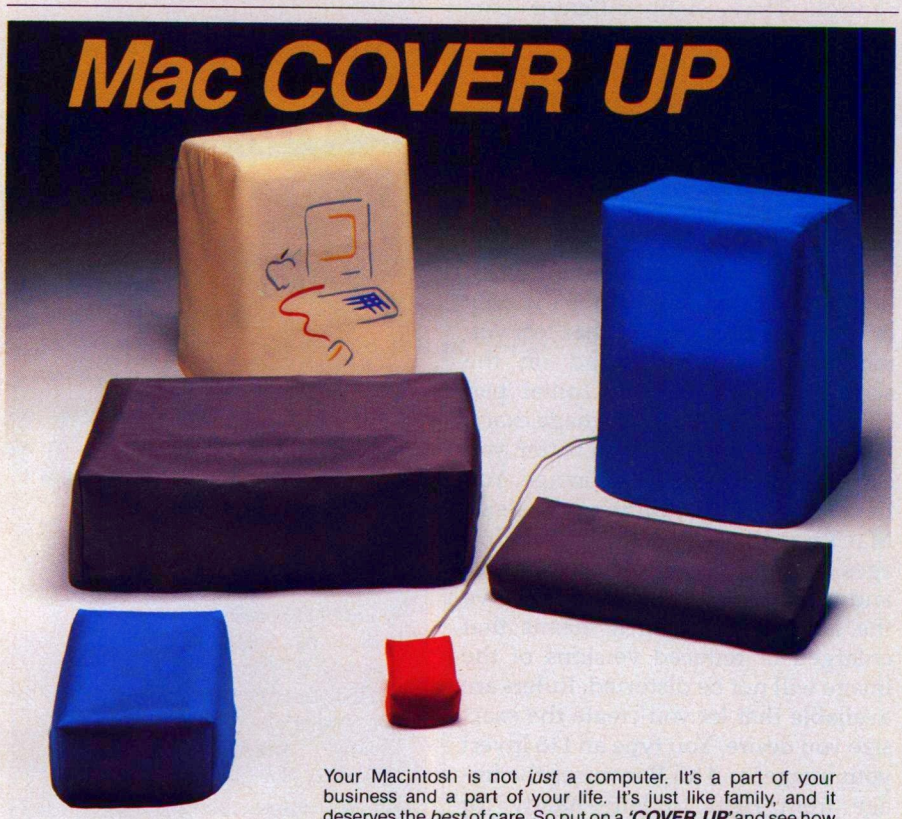

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MacTablet: The Digital Drawing Board

A control alternative to the mouse for graphics applications and other painting, selecting, and procedural tasks

Are you captivated by MacPaint and impressed with MacDraw, but still find the Macintosh falling short of a professional graphics system? Perhaps it's time for you to stop mousing around and explore the possibilities of a digitizing tablet. Summagraphics' MacTablet is one of the first of these control devices available for the Mac.

It won't transform your Mac into a complete CAD (computer-aided design) workstation overnight, but it will expand the ways in which you can create visuals and incorporate outside designs. MacTablet allows you to do freehand sketching, drawing, and tracing with more precision than with the mouse. Architects, planners, engineers, designers, and artists will find the addition of this system a sound investment.

Configuration

A digitizing tablet, like a light-pen system, provides a stylus-like pointer that connects to the computer by a wire. The accompanying software mediates the signals between the low-intensity magnetic field of the pointer, sensing wherever it is on the x,y coordinates of the grid in the tablet, and the program that is running at the time. Summagraphics' MacTablet is a flat, plastic rectangle about the size of a swanky restaurant's menu, finished in the same almond color as the rest of the Macintosh collection. We have come to expect all things Macintosh to be easy to assemble, and this peripheral is no exception.

The stylus cord plugs into the tablet with a phone-type socket, similar to the Mac's keyboard connector. A dual-purpose cord connects the computer to the tablet and to the power supply. There is no on/off switch for the power supply, but you can unplug the unit or leave it plugged in without concern, just as you would an electric clock. The cord's 9-pin D connector plugs into either the modem port or the printer port on the back of the computer. If you need telecommunications ability, as well as the ability to print, then a port-expansion peripheral could be the next item on your shopping list (see "The MacEnhancer" in the March issue of *A+*, pages 82–85).

The tablet comes with a stick-on stylus holder and four rubber feet to hold it fast in a flat position. A tilt bar clips on underneath in either the horizontal "landscape" or the vertical "portrait" orientation. The latter suggests that Summagraphics has heard the same rumor that we have about the advent of an enhanced Mac for 1986 with an 8½ × 11-inch screen, on a vertical bias like a printed page.

As with an increasing number of hardware and software enhancements currently being released (MacVision and Effects are examples), MacTablet's control program resides as a desk accessory in each application program you wish to use. Desk accessories provide immediate, pop-up responses without the delay of going through the Finder. From the MacTablet disk provided, installation in the program is simple. Each time you call up MacTablet from a program's Desk Accessory menu, a dialog box asks which connection port is in use and displays a Start and a Stop button. These buttons activate and deactivate MacTablet within that program.

The benefits of accessing a peripheral as a desk accessory are substantial, but not without problems. Unlike the mouse, whose software control is within the machine and therefore always "on" and "in," MacTablet requires that you keep track of which disks you have installed it in. I have resorted to the same solution that I use to code my disks that are without an operating system—colored stick-on dots, available from office-supply stores.

More frustrating are the frequent occasions when installation is rejected with the message, This disk does not have enough free space to add this desk accessory. The most serious limitations occur when you encounter programs that are sealed to desk accessories, such as MacPuzzle and MacAttack. Filevision, one of the most promising candidates for use with a digitizing tablet, is programmatically incompatible with this release of MacTablet. Jeffrey Arnst, software writer for the MacTablet, reported that he has al-

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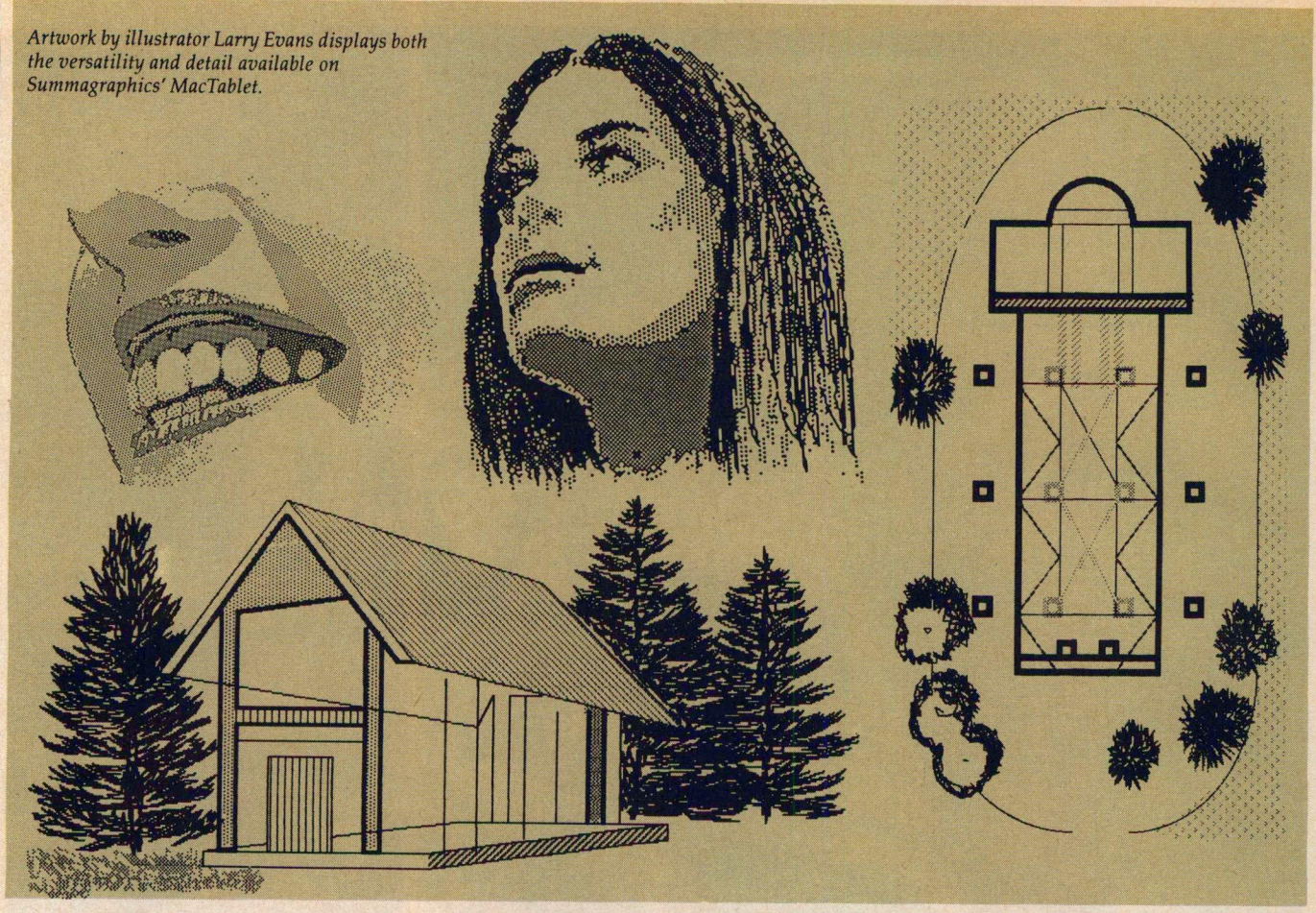


Artwork by illustrator Larry Evans displays both the versatility and detail available on Summagraphics' MacTablet.

ready ironed out those kinks in the code, and updates of MacTablet will run Filevision.

Since MacTablet is dependent upon desk-accessory space, a program called Desk Accessory Mover is a valuable "cleaning tool" for any user of this peripheral. When Apple included such party favors as the Puzzle and Key Caps in the desk-accessory menu, it was to show what was possible, not just to eat up 20K of precious memory. Desk Accessory Mover uses the same operational structure as Font Mover does, which permits you to strip out the accessories you don't need, keep some in a holding area, and rearrange the menu.

Operation

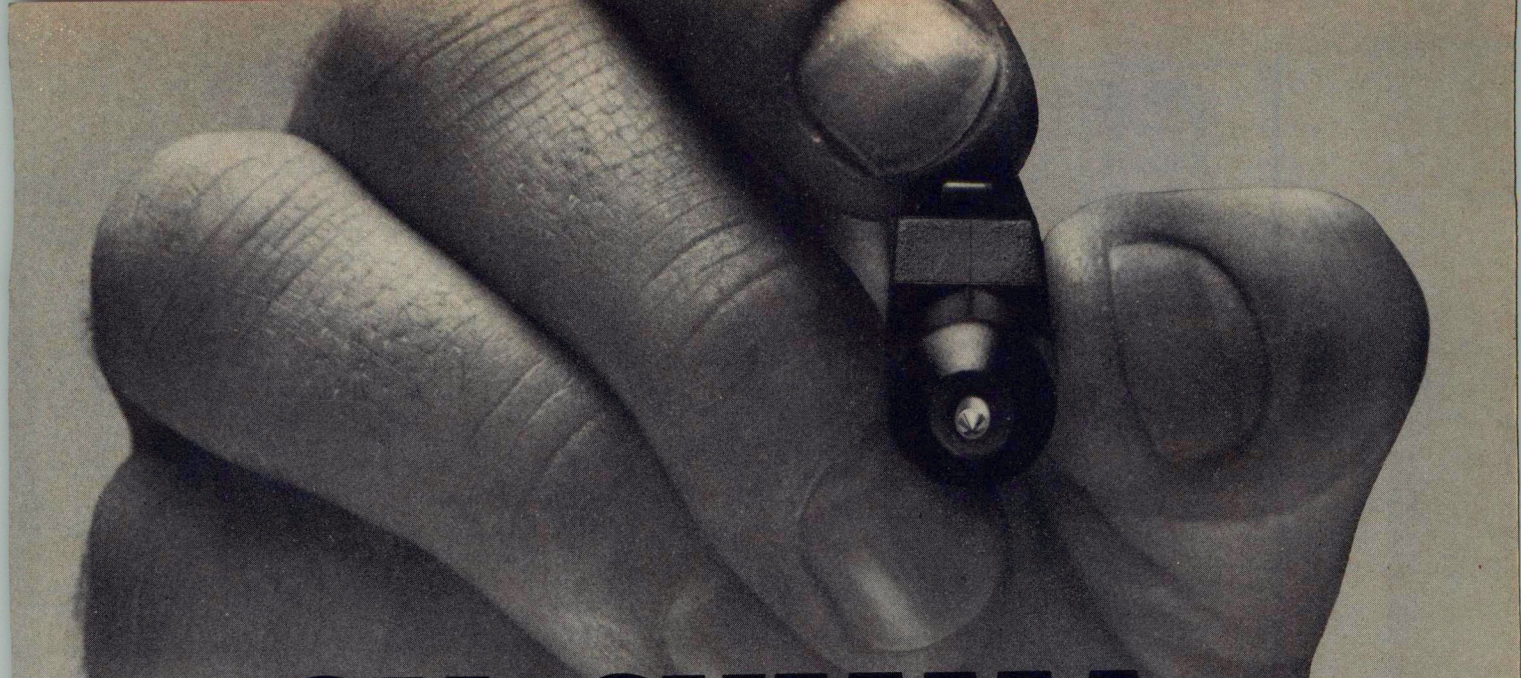
Once it is running, MacTablet is a joy to use. You can alternate using keyboard and mouse, and the tablet makes a first-class mouse pad. You can't use the stylus and the mouse at the same time, however. The operating principle of the digitizing tablet is similar to that of the mouse that came with your Mac, but with an important distinction. The mouse's positioning is relative; it will move the cursor in increments, no matter where you roll it—on the desk, on your knee, even on the cat as it strolls by. But the tablet's positioning is absolute; each point on the tablet corresponds to a specific point on the screen.

After using it for even a short time, I found that I could move the stylus on the tablet with accuracy while still looking at the screen. As I punched in commands to the menus of MacPaint and MacDraw, my eye/hand coordination became smoother, and the procedure became second nature. The stylus fits well in the hand, and the cable behaves without becoming cumbersome. The stylus has two controls, each providing the same function as the button on the mouse. The stylus has a blue button on the barrel and a spring-loaded sharp plastic tip, which has to be pushed in far to actuate the control. Watch out for your disk—the stylus is magnetic!

Simply waving the stylus over the tablet without contact issues many commands. The tablet has a resolution of 500 lines per inch, which permits much finer detail in a drawing than you can get with the mouse. Few artists have been able to create finished, freehand drawings with the mouse: the stylus and tablet are more appropriate tools for this.

Summagraphics has announced the availability of a puck for the MacTablet, although it was not available for this test. Pucks, used in computer graphics, are electromagnetic sensing disks with one or more buttons for controls, connected to the tablet by a cord. The artwork is visible through the transparent center that has a cross hair etched on it. True to their ice-hockey namesakes, these pucks slide across the surface of the tablet like frisbees with bombsights. What I like about pucks is that you can achieve finer traces, and they stay put where you leave them.

One of the first things you notice when using MacTablet with a graphics program is that the tablet's active area is indicated by an incised rectangle. The drawing-board window of each program is, in turn, a smaller area within that rectangle, framed by the menus and scroll bars. If you use several programs such as MacPaint, MacDraw, and MacDraft, it might be wise to draw the different window areas on the tablet, each with a different color of ink. If there is one program you use consistently, lay down the window with graphic tape such as



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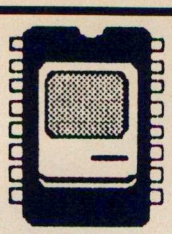

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ChartPak; then you can feel it as well as see it.

A digitizing tablet is superior to a light-pen system for tracing. The screen isn't obscured while you are working, and original art tends to lie flat on the tablet with less trouble, especially when it is a book, magazine, or large blueprint. Use drafting tape or Scotch Magic Tape on the tablet to hold the work in place. You will have to decide which control—the button or the point—is most comfortable for you and the work you are doing. One major difficulty I found with the point of the stylus was its unyielding sharpness; it tended to gouge a groove in the paper. I let the stylus scratch artwork that I didn't need to keep. For other originals, such as book illustrations, I used a sheet of acetate as a tracing shield. Summagraphics has promised a variety of points, or "refills," including a smooth metal point.

The MacTablet system works with any program that will accept its installation as a desk accessory. Using it with a word-processing program would be a hunt-and-peck operation, but programs for analyzing and organizing data such as Multiplan and MacProject run very efficiently with a tablet. Games such as Backgammon, Missile Command, and Life could have been designed with the tablet in mind. Overall, MacTablet is a well-designed professional tool for the Mac, and it's constructed with a quality that should assure years of use. ✚

Anthony Reveaux is a San Francisco writer and editor of Computer Publicity News, *a contributing editor of* Artweek, *and a lecturer in film history at Sonoma State University.*

PRODUCT INFORMATION

MacTablet
Summagraphics Corporation
777 State Street Extension
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(203) 384-1344
List Price: $495
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Desk Accessory Mover
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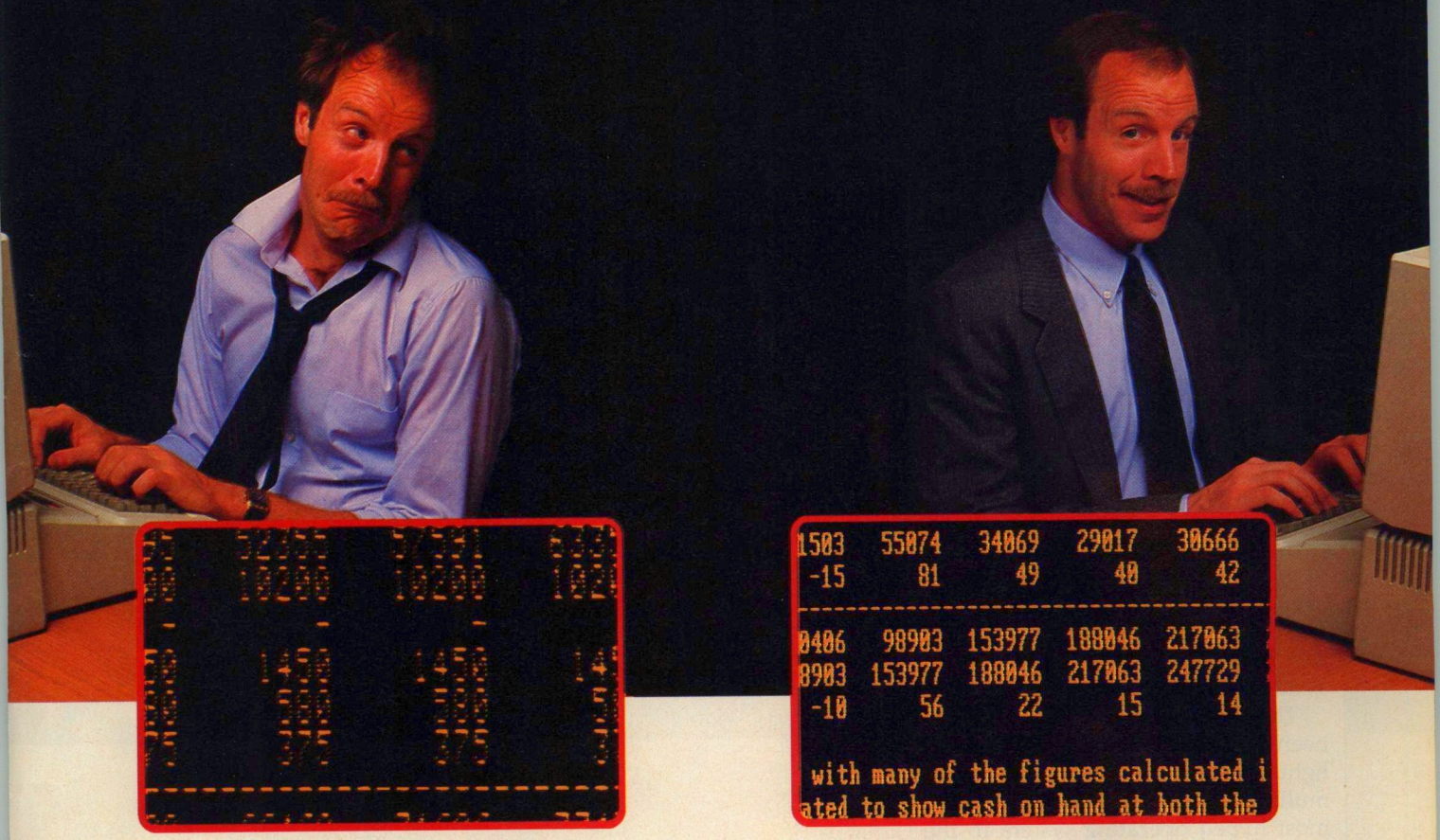

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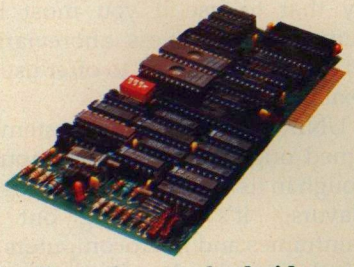

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A peanut butter and sardine sandwich—that's how some computer companies imagine the meeting of the Macintosh and the UNIX operating system: a few things in common, maybe, but an unusual combination that's definitely an acquired taste.

The combination of these highly touted products—the machine for the rest of us and the operating system that can link the rest of us together—has captured the interest of several firms, however, particularly in the business market. Because they are so dissimilar on some levels, hooking the two together has been tough sledding, but it's not an idle pursuit.

What the marriage of UNIX and the Macintosh could produce is something many firms would give their eyeteeth to possess: a computer operating system that is capable of handling many users, with the users working and/or playing at easy-to-use, user-charming workstations. Sounds tempting, doesn't it?

A bit of discussion is in order on just what UNIX is, before we delve into whether UNIX and the Macintosh belong together.

Multiuser systems are the wave of the future in business, and the Mac, linked to the UNIX system, may ride in on the crest.

What Is UNIX?

The UNIX operating system has been billed both as "the hacker's delight" and as the savior of business multiuser systems. It is perhaps the most hyped operating system in the known universe. It is the epitome of a "nonintuitive" system, which is to say that to use it you must have memorized countless abbreviations. Yet it has a great deal to offer users in flexibility and function.

UNIX is an operating system designed originally for minicomputers, though in its various incarnations and "flavors," it's branching out into mainframes and microcomputers that have heftier chunks of memory.

Like AppleDOS, SOS, or ProDOS, UNIX serves as the intermediary between the user, who is employing an application program (such as FORTRAN or MacWrite), and the hardware. Unlike the Apple operating systems, however, UNIX is designed to let multiple users toil at multiple tasks simultaneously.

We can categorize UNIX's components into three areas: the kernel, the heart of the operating system, which schedules the tasks and allocates storage of data; the shell, a program that interprets the user's commands, calls up programs from memory, and executes them in order in a structure called a pipe; and utility programs, which perform various routine and specialized functions.

One strong point of UNIX is the way the system organizes its files in a hierarchical structure rather like a tree diagram, somewhat easing the task of locating your files.

UNIX has excelled up to now in the areas of text preparation and printing, document storage and manipulation, and programming. As the system leaves the academic world and enters the commercial arena, other applications are creeping into the marketplace, particularly in vertical markets such as medical/dental, financial planning, and publishing.

A Bit of UNIX History

According to *The UNIX System Encyclopedia* by Yates Ventures, UNIX was developed in 1969 by Bell Labs researcher Ken Thompson to run a program called Space Travel, which simulated the motion of the planets and other objects in the solar system. Thompson wrote UNIX to run on a PDP-7 computer from Digital Equipment Corporation (DEC).

At first UNIX was written in assembly language, the machine-dependent language that differs in each brand of computer. Because Thompson wanted UNIX to be easy to move, or "port" from one type of computer to another, he wrote a high-level language he called B, designed for easy transport between computers. Then fellow researcher Dennis Ritchie modified B to produce C, after which he tweaked and trimmed the existing UNIX software into C, and UNIX was now "portable."

Bell Labs didn't do much with UNIX for years. Bell granted scores of educational institutions inexpensive licenses to use the operating system. Universities and colleges, being fertile ground for multiuser systems, took to UNIX instantly—perhaps 90% of college campuses use some form of the operating system. Certain companies liked what UNIX could do and developed their own versions of the UNIX system, "workalikes" or

"lookalikes" that might or might not owe anything to Bell Labs.

Came the divestiture, and Bell Labs looked around and realized that it was sitting on a gold mine in the UNIX system. Bell Labs, now AT&T, decided to make its product truly marketworthy and became touchy about what it would allow to carry the trademarked name UNIX.

It was too late though. At this writing, there are scores of versions of Bell Lab's original UNIX system, some using licensed code from AT&T and others that can't legally be called UNIX.

As a result, software and hardware manufacturers have been begging for "standardization," for a set of ground rules about what is really UNIX, so that the industry can at least depend on *something*. AT&T's insistence that its System V UNIX is the standard and that UNIX was its product in the first place anyway, is having some effect. Meanwhile, it isn't quite enough to say a piece of software is "compatible with UNIX"—you need to know *which* UNIX.

UNIX and the Macintosh

At this writing, the only way that the UNIX system can work with the Macintosh is via some kind of network or fileserver. The UNIX system currently takes up about 1½ megabytes of disk space, so not even the 512K Mac can handle UNIX alone—not without a hard disk.

These memory limitations won't always be the case. For one thing, as microprocessor technology advances, we'll eventually see more embedded operating systems—"UNIX on a chip." (You can make a lot of software-company executives sweat if you whisper those four words to them, but you wouldn't feel well either if you thought about technical advances making years of staff-hours obsolete.)

UNIX AND THE MACINTOSH

Who might want to use UNIX with the Macintosh? Either companies that already have a UNIX system and want to integrate the Macintosh into their gaggle of workstations, or companies that already have Macintoshes and would like to link them into a multiuser system. Ideally, the advantage of mixing Macs and UNIX is that the Macintoshes could be independent until you wanted to integrate them into the system.

The standardization debate will probably eventually be resolved in favor of AT&T's System V UNIX, although some of the companies we're going to look at are using a version from the University of California at Berkeley called 4.2BSD as their standard. In either case, Macintosh users won't have to deal with nearly as many UNIX versions.

Multiuser systems—probably networks of intelligent workstations, rather than stand-alone PCs of any stripe—are the wave of the future in business. Apple has certainly realized this trend, and is doing its best to give the Mac a toehold in the business marketplace, where it reportedly now holds only a 10% share.

What follows is a quick overview of the products now or soon to be available for linking your Macintoshes to the UNIX system.

Ultra-Office

Lutzky-Baird Associates in Culver City, California, works closely with Apple as the third-party vendor of Ultra-Office software, products designed to work with the AppleTalk network.

Ultra-Office currently works only

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with the Macintosh and the Zilog S8000 minicomputer. It can boost the size of the AppleTalk network from the current limit of 5–25 Macintoshes to "theoretically unlimited" numbers by linking AppleTalk networks to the S8000. Companies can then link the multiple Zilog units together.

Although this networking capability may be one of the major drawing cards for the data-processing departments in major companies, one of the best things about Ultra-Office from the user's standpoint is that it makes UNIX *visually* clear. The system uses Macintosh icons to represent the UNIX hierarchical file system, enabling you to trace the hierarchy of files, layer by layer, by eye. Other than that, users don't need to know that they are connected to the UNIX system. Says Andrew Olson, Lutzky-Baird director of sales, "It shows you what it's like walking through a filing cabinet."

Says Olson, "The Macintosh Office isn't competing with IBM. It's offering a supplemental function that perhaps the IBM Personal Computers don't have: the graphics and so forth. It can coexist with the IBM PC—in six months we will have IBM PCs tied into the network."

Olson adds that he thinks the Ultra-Office product is the only true fileserver on the market. Lutzky-Baird hasn't stopped there, however. Olson reveals that the company is currently working with its own prototype of the "diskless Mac," a Macintosh that can access the Zilog computer directly, as though it were a Macintosh disk drive.

Only last year, the people at Touchstone Software Corporation in Seal Beach, California, decided to develop a series of products that helped various computers work together. Touchstone now has a total of three networking products—PCworks, UniHost, and MacLine—which combine to permit users to transfer data among Macintoshes, UNIX systems, and IBM PCs. For the Macintosh/UNIX linkup, you need both UniHost and MacLine. In this setup, the UNIX system becomes a "network manager," letting the Macintosh utilize UNIX software and hardware.

Using Xinet, any user on a connected UNIX system gets access to AppleTalk network servers.

With these "connectables," you can move a Multiplan file from your Macintosh to a PC, transfer a text file from your UNIX system to your Macintosh, or convert data back and forth from Macintosh format to MS.DOS or UNIX format.

Unlike the Lutzky-Baird package, MacLine and UniHost work with a wide range of UNIX versions, including a recently announced one for the VAX VMS system from DEC.

Touchstone developed the product entirely independently from Apple, says Shannon Jenkins, vice president of marketing for Touchstone. "The main difficulty wasn't in the programming, but in developing tools," she adds. They decided to write the products in C, but by the time they were through, they were on their third or fourth C compiler, because, she explains, "the compilers we tried initially were very immature. If you're a serious developer that's a real kick in the stomach. Each time you change compilers, you buy yourself two weeks of confusion."

Touchstone is now developing a version that will take advantage of AppleTalk, working with Apple's RS-232 gateway product, to connect Macintoshes using AppleTalk to "all the other systems."

MT XINU and Xinet

Last April the UNIX-specialist company MT XINU in Berkeley, California, announced Xinet, a network system that lets Macintoshes in AppleTalk networks communicate with a variety of UNIX-based machines. MT XINU incorporated the AppleTalk protocols in cooperation with the communications software firm Northlich-McCreary Associates.

Using Xinet, any user on a connected UNIX system gets access to AppleTalk network servers such as the LaserWriter laser printer. Xinet also lets UNIX act as a server on the network, which lets individual Macintoshes take advantage of mass storage, communications links, and other UNIX facilities.

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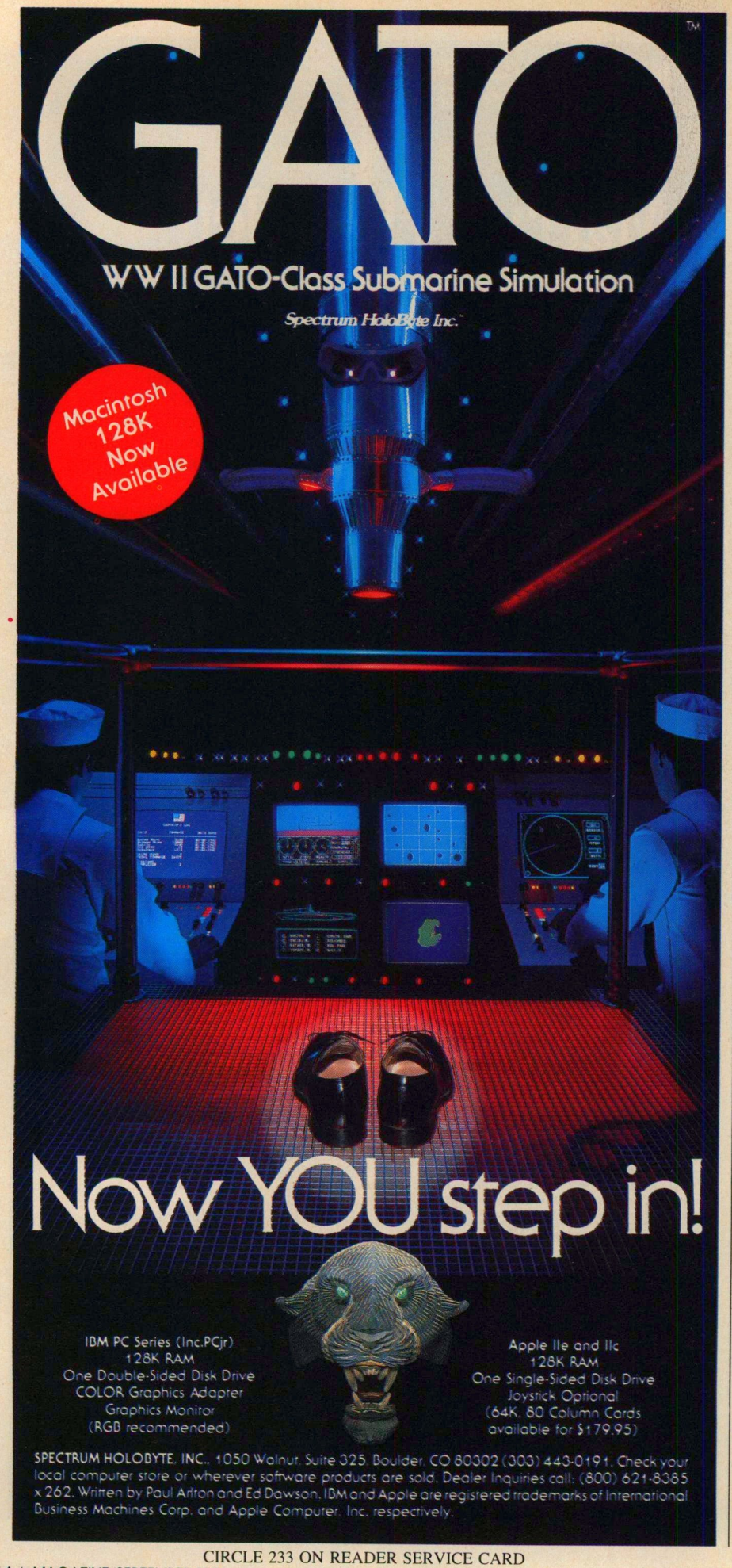

CIRCLE 233 ON READER SERVICE CARD

Says Robert Kridle, president of MT XINU, "We're committed to developing in the UNIX environment with the protocols Apple provides. We want to make UNIX conform to what Apple wants to do with remote files—we're primarily writing software for UNIX, not Macs."

At this point, the company has targeted original equipment manufacturers (OEMs) as its market, rather than businesses or users.

BLAST

A Baton Rouge, Louisiana, firm called Communications Research Group released a product called BLAST at the start of 1985. BLAST links a wide range of UNIX-based computers; any computer running BLAST can transfer files to another computer running BLAST.

Paul Charbonnet, director of marketing for BLAST, says that BLAST can serve as a gateway to many computers, including Apple computers—not just the Macintosh, but also computers that use Apple-DOS and CP/M. Charbonnet says that until recently UNIX has been kept in the technical, program-development areas of computer use, but that with products such as BLAST, users of various machines can take advantage of the system.

BLAST itself doesn't look like a Macintosh program once you've selected its icon, he comments. "All BLAST versions look alike, the same screens, the same error messages." This consistency is to the advantage of corporate data-processing managers, who have to learn to use the product only once.

TOPS

TOPS, from Centram Systems West in Berkeley, California, is still in the development stage, but it looks like it will be a comprehensive link to UNIX systems.

Like Xinet, TOPS is designed to be compatible with AppleTalk and provide an expansion to that system. It's also expected to link dissimilar operating systems and make them essentially "transparent" to one another. Robert Kridle of MT XINU says that TOPS is a real distributed-file system. With this kind of system, he says, "You shouldn't care whether files are on UNIX or on the Mac. You should

be able to use a WordStar or a 1-2-3 program without knowing or caring."

Centram's president, Nat Goldhaber, says that TOPS is an "inter-operating-system language that lets different operating systems communicate with each other. The printers and files of one appear on the other's operating system." In effect, the resources of the UNIX system will look just like another disk drive on your Macintosh system. For instance, you can use your Macintosh to view the directory of the remote hard disk of an IBM PC/AT. Says Goldhaber, "The beauty of this is that TOPS is always acting as a kind of simultaneous translator without changing what's out there."

TOPS was not being shipped at this writing, but availability is expected beginning October 15, 1985.

Can UNIX and the Mac Mix?

Just how much of a market is there for a Macintosh/UNIX combination? The market hasn't answered this question yet. Paul Charbonnet at Communications Research says he sees the Mac as "a small part of a big picture." He estimates that the intersection of the two markets is about 12% of CRG's target audience; it sells about five to six copies of BLAST per month for that purpose.

A lot depends on what Apple does with AppleTalk. AppleTalk is slower than some popular networks, such as Ethernet, but it's about 20 times faster than the fastest RS-232 line. Says Kridle, "Apple's approach has been to get the price really low and get enough functionality so people can develop network applications."

Some of the companies working with Apple in this area aren't sure that Apple has a firm grasp on how it wants to deal with UNIX. According to one software developer, Apple employees are normally easy to work with, but "when you get down to UNIX, the veneer cracks. They say, 'Well, we're just a small company; we don't have time to deal with that.' The reaction has to do with the pressure, being pulled in so many directions."

Shannon Jenkins of Touchstone says it's not much better when you talk to UNIX vendors about the Macintosh. "UNIX OEMs are grappling with so many other problems that they don't have time to consider this product very well—they roll their eyes and say, 'Please, I have enough to cope with.' Many have only the faintest idea of what personal computers are all about."

You will be hearing a lot more about the UNIX system in years to come.

Bradley Morse, Touchstone's director of marketing communications, speculates that his company's products, like others, are aftermarket issues for Macintosh owners, but *pre*market issues for UNIX users. Products that connect the UNIX system and the Macintosh are important, he says, because "in the micro field, people tend to buy what they have at home."

UNIX/Macintosh links greatly magnify the potential for telecommuting and reduction of paperwork. Several companies say they find that users are interested in the possibilities of connecting the Mac to UNIX, to exploit the powers of both.

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If you've just started hearing about the UNIX operating system, rest assured that you will be hearing a lot more about it in years to come. If you've just started to think about what the Macintosh could do when hitched up to UNIX, you're not alone. These two dissimilar but increasingly powerful systems won't be kept apart for long. ✚

Vanessa Schnatmeier is a free-lance writer whose chief interests are women's issues and computer marketing.

PRODUCT INFORMATION

BLAST
Communications Research Group
8939 Jefferson Highway
Baton Rouge, LA 70809
(514) 923-0888
List Price: $250 for micros, $595–895 for minis, and $2495 and up for mainframes
CIRCLE 460 ON READER SERVICE CARD

PCworks, MacLine, and UniHost
Touchstone Software Corporation
909 Electric Avenue
Suite 207
Seal Beach, CA 90740
(213) 598-7746
List Price: PCworks, $195; Macline, $145; UniHost, $295; MacLine and UniHost package, $495
CIRCLE 461 ON READER SERVICE CARD

TOPS
Centram Systems West, Inc.
2372 Ellsworth Avenue
Berkeley, CA 94704
(415) 644-8244
List Price: unavailable
CIRCLE 462 ON READER SERVICE CARD

Ultra-Office
Lutzky-Baird Associates
5601 Slauson Avenue
Suite 222
Culver City, CA 90230
(213) 649-3570
List Price: $300 per Macintosh in network; $2000 per Zilog computer
CIRCLE 463 ON READER SERVICE CARD

Xinet
MT XINU
739 Allston Way
Berkeley, CA 94710
(415) 644-0146
List Price: $1500 for binary form "in VAX magnitude" and approximately $10,000 for C-language source code for developers
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Do you press print and wait? And wait? And wait?

Your waiting is over with the Universal Data Buffer—it frees your computer in seconds while it handles the printing of your file.

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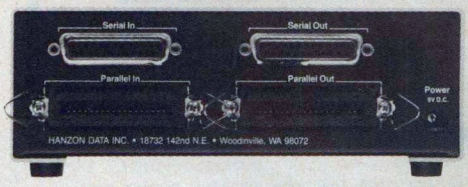
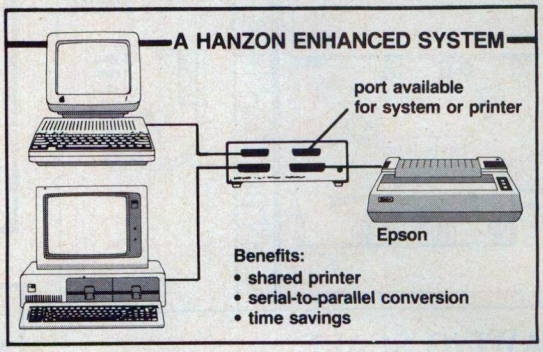


In this HanZon application we are interfacing an IBM-PC and an Apple IIc to an Epson printer. The Universal Data Buffer automatically handles the serial-to-parallel interfacing and also manages a first-in, first-out file priority for the two computers.



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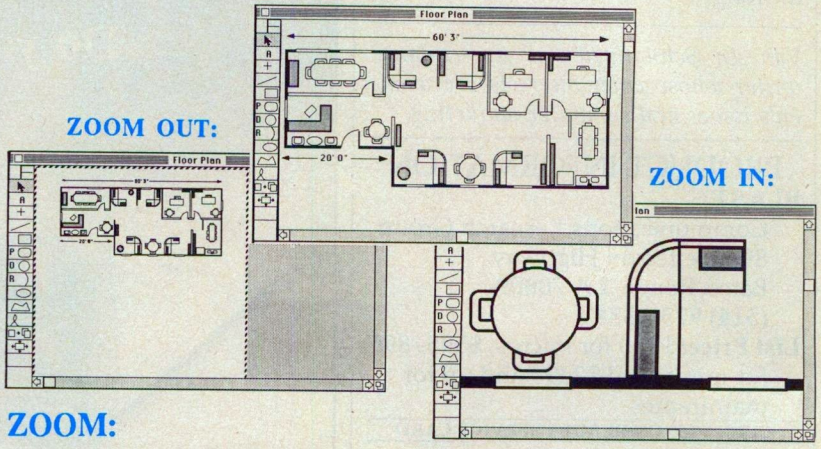
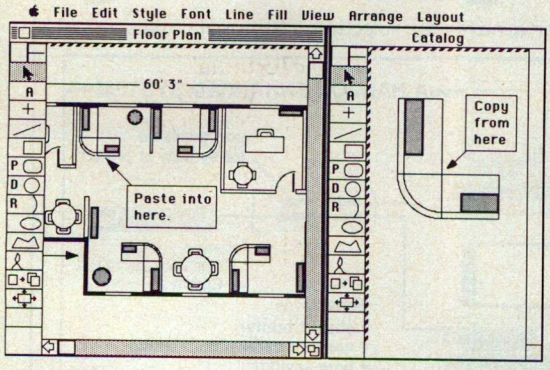


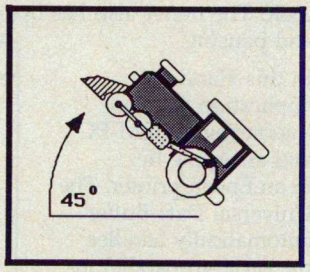
ZOOM:

The Zoom functions allow you to see either a reduced or magnified view of a drawing, while still enabling you to have full access to all of the drawing capabilities of MacDraft™. You can Zoom Out from the normal viewing window, until you can see an entire drawing, regardless of its size. While at a zoomed out view, you can easily add large objects or lines to your drawing that may actually extend beyond the viewing window. Or, you can Zoom In to magnify your drawing, and add fine details that may not be convenient to create at a normal view. You can zoom in on any part of your drawing up to eight times its normal magnification.



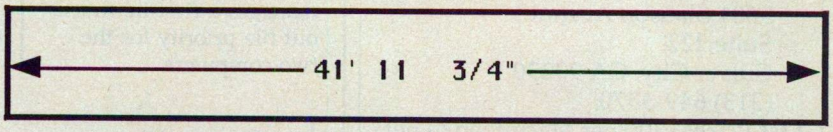
DRAWING SCALE:

MacDraft™ offers 16 different Feet & Inch scales, as well as 12 Metric scales for your use. This versatility allows you to create a drawing at one scale, and then if you wish, have it automatically converted to a different scale. You can also have several drawings, all at different scales, displayed on the screen at the same time, and can copy and paste between them. When you paste an object into a drawing with a different scale, the object will automatically adjust in size to conform to the scale of the new drawing.



ROTATION:

MacDraft™ allows you to rotate single or grouped objects in as little as one degree increments. You can also rotate multiple objects about their individual centers, or group them, and rotate them about the center of the group.



AUTO DIMENSIONING:

This feature allows you to automatically add dimension lines to your drawing, so you can display the sizes of various lines and objects. The dimension lines display the proper size of the object, regardless of the scale of the drawing.

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MacTips

Suggestions from our readers

QUICK EXIT

We mostly use our Mac as a word processor with MacWrite. We get very angry and tired because it takes so long to leave a document and go to the Finder. So, after a little experimentation, we found out that we could leave a document much faster by first closing it to save it. Second, we opened the File menu and chose Open. Then a dialog box appeared on the screen asking if we wanted to open another document, cancel, or eject. Naturally, we chose Eject, and—presto—our disk immediately popped out of the disk drive.

Tapan R. Shah
Davison, MI

SPREADSHEETS AND STOCKS

I read with interest your article in the May issue of *A+*, ("Tame the Bulls and Bears with Your Macintosh," pages 92–98) about setting up spreadsheets to track stock portfolios. I'd like to offer this MacTip for folks who have the communications and spreadsheet programs but don't want to blow $250 for a program to "link" the output of the database to Multiplan or Chart.

First, download your data as usual on Straight Talk, or any other communications program, and then transfer it to MacWrite. It will look like figure 1. When you have finished, make use of that curious tab that's set as a default on MacWrite when you open it. Since Multiplan only reads tabs and carriage returns to load data into cells, you'll need to add some to your data, or the first line of data will be read as one cell, as will the second, etc. Place the cursor at the beginning of the first line of data and press the Tab key.

Then place the cursor where you want the second column of data to begin (in this case, before the word *Symbol*) and press the Tab key again. Go through this process until you get to the second data line, and leave the material to go into the first column at the far-left edge of the screen. Tab over the second column, and continue tabbing down until you reach the first column of the third data line. When you have repeated this through all the data lines, you should end up with a column of quotes under the right-hand tab and a wide-spaced column of data on the left side of the page (see figure 2).

Copy the information to the clipboard and leave MacWrite. Boot Multiplan and set the cursor at the upper left corner of the first column you want on the spreadsheet; then paste the material from your editing session onto the Multiplan spreadsheet. If you've correctly tabbed in all the data, everything will line up correctly, and you'll be able to use the data for record-keeping or calculations (see figure 3).

Although this process may seem tedious, it works quite quickly with even large amounts of data (e.g., 30-day moving averages).

Rod Green
Fort Myers, FL

MACTERMINAL AUTO-LOG-ON

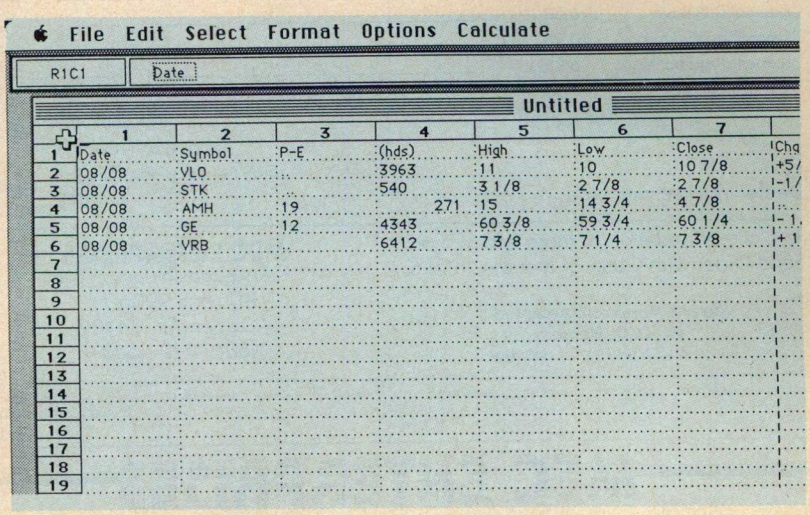
Many communications terminal programs have automatic log-on features. There is no such critter on Apple's MacTerminal program, but there is an easy way to communicate your ID number and/or password quickly to services that use them. Keep your passwords/ID numbers on the Macintosh Note Pad—preferably on one of the back pages out of casual

Date	Symbol	P-E	(hds)	High	Low	Close	Chg.
08/08	VLO	..	3963	11	10	10 7/8	+5/8
08/08	STK	..	540	3 1/8	2 7/8	2 7/8	-1/8
08/08	AMH	19	271	15	14 3/4	4 7/8	..
08/08	GE	12	4343	60 3/8	59 3/4	60 1/4	- 1/8
08/08	VRB	..	6412	7 3/8	7 1/4	7 3/8	+ 1/8

Figure 1: Your downloaded data transferred to MacWrite will look like this.

```
Date                    Symbol
                        P-E
                        (hds)
                        High
                        Low
                        Close
                        Chg.
08/08                   VLO
                        ..
                        3963
                        11
                        10
                        10 7/8
                        +5/8
```

Figure 2: Inserting tabs between fields produces a column of quotes in MacWrite.



	1	2	3	4	5	6	7	
1	Date	Symbol	P-E	(hds)	High	Low	Close	Chg
2	08/08	VLO	..	3963	11	10	10 7/8	+5/
3	08/08	STK	..	540	3 1/8	2 7/8	2 7/8	-1/
4	08/08	AMH	19	271	15	14 3/4	4 7/8	..
5	08/08	GE	12	4343	60 3/8	59 3/4	60 1/4	- 1.
6	08/08	VRB	..	6412	7 3/8	7 1/4	7 3/8	+ 1
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								

Figure 3: When you paste the material from your editing session onto the Multiplan spreadsheet, everything should line up correctly.

view. Just before you make a call, open the Note Pad and copy the appropriate log-on information to the Clipboard. Initiate the call, and when you're asked for your ID number, just choose Paste, and it relays your ID number to the service you're calling. This method of logging on also helps you avoid typos during the log-on process.

I also make a note of my time charges on the Note Pad following each CompuServe call and check it against my monthly bill.

Chuck Snyder
San Rafael, CA

INFORMATIVE BACKGROUNDS

Have you ever wondered which system disk is in control of your Mac? Well, I've often wondered, so I use the changeable (via the control panel) screen background (see figure 4).

The background can be representative of the name of the system disk with which it is associated. For example, I presently have five MacWrite system disks, which are cleverly numbered 1–5. Therefore, since MacWrite is the software I use most often, I have simply made the numeral associated with the disk repeat to form the background patterns. Other disks have abbreviations of the disk names or pictures representing them as their backgrounds.

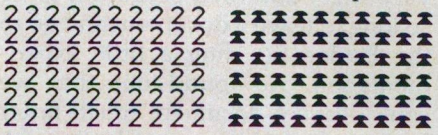


Figure 4: Informative screen backgrounds for a second system disk and a telecommunications disk

I have found this method of "labeling" my disks extremely helpful in avoiding the frustration of wondering which system disk is actually operating the Mac and, therefore, which Scrapbook, Note Pad, etc., will be available.

Kenny Newman
North Hollywood, CA

PRINTED DISK DIRECTORIES

To keep track of the files on your disks without having to read them from the Mac desktop all the time, make a printed copy of the directory. While the disk is in the drive, open it and choose By Name from the View menu. Size the window so all the names can be read and press Shift ⌘4 to print the directory window. Cut away the extra, blank, paper and tuck the disk directory into the disk's plastic envelope when you put it away. The updated version of MacPaint has a Print Catalog feature that prints miniature versions of all the MacPaint documents on the diskette. If you want a directory of documents on a diskette other than the application diskette, open a MacPaint document from the diskette first. You can leave the document in the window or close it, but the next time you choose Print Catalog, the computer will catalog the document disk.

Sharon Aker
Sussex, NJ

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Mouse	4.50					
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Printer (specify type)	10.95					
Numeric Keypad (Mac)	6.95					
The Bernoulli Box	7.50					
					SUBTOTAL	$
					Shipping and Handling	$ 3.00
					Utah Residents add Sales Tax	$
					TOTAL	$

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MEC ENTERPRISES

CIRCLE 147 ON READER SERVICE CARD

MacLink

...the "intelligent" link between your Macintosh and the IBM PC

MacLink allows you to translate spreadsheet and word-processing files between the Macintosh and the IBM PC...easily and quickly.

Now you can translate spreadsheets between Lotus on the PC and Multiplan on the Mac...including formulas, column formats, and functions.

And MacLink allows you to transfer any other type of file between the two machines as well...including binary, comma-delimited, DIF, SYLK, and text files.

MacLink's integrated communications and unique translators work

Unique PC ↔ Mac Translators!

And you can translate documents between Wordstar or Multimate on the PC and MacWrite on the Mac...including margin settings, paragraphing, columns, and print styles.

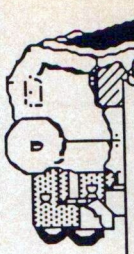
via modems or with an optional PC to Mac cable.

The cost is just $125: This includes the MacLink manual, and a MacLink disk for both the PC and the Mac.

DataViz, Inc.-16 Winfield Street-Norwalk, CT 06855
(203) 866-4944

Trademarks: IBM, Lotus, Macintosh, MacWrite, Multimate, Multiplan, Wordstar

CIRCLE 333 ON READER SERVICE CARD



"ChipWits is a program every Mac owner should have... Plus it's a lot of fun. Get it."
Byte, July 1985

"ChipWits... is the BEST Macintosh program now available. ChipWits is fun and educational and it is a masterpiece of programming"
MacNews Update #4

"Not too many reviews come with guarantees, but this one guarantees that if you like programming you'll love ChipWits."
MACWORLD, July 1985

ChipWits, the robot programming adventure!
Macintosh, $49.95 64K Apple II, $39.95

BrainPower, Inc.
24009 Ventura Boulevard
Calabasas, CA 91302
(818) 884-6911

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170 Page Book on Apple/Mac/IBM Both Software and Hardware.

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Micro Analyst Inc.
P.O. Box 15003
Austin, TX 78761
512 - 926-4527

Price	
Mac Zap	$60
Book (Optional)	$40
Ship ($10 Overseas)	$02

Visa/MasterCard Accepted

CIRCLE 348 ON READER SERVICE CARD

A+ pipeline

FINGERPRINT PLUS INTERFACE CARD

FingerPrint Plus is a printer-interface card that allows an Apple II computer to communicate directly with a printer so that users can get a screen dump without interrupting an ongoing program. The card can work with both a parallel- and a serial-interface printer simultaneously and can produce output even if software was not designed to support output to a printer. The product provides more than 30 menu-driven print command options, such as side-by-side graphics, page numbering, and background and foreground color capabilities, and users can also freeze action and return to it at a later time. *(List Price: $149)*

Requires: Apple II, II Plus, or IIe; printer

Thirdware Computer Products
A Division of Precision Software, Inc.
4747 N.W. 72nd Avenue
Miami, FL 33166
(305) 592-7522

CIRCLE READER SERVICE NO. **501**

VARICALC EQUATION-SOLVING SOFTWARE

An interactive equation-solving software package, Varicalc is designed to perform all types of mathematical and financial calculations, optimizations, and numerical simulations. Users can solve for variables on either side of the equal sign, perform simultaneous calculations on 15 equations containing up to 19 variables, store up to 255 formulas on the program disk, and, by using "variators," can change the value of up to five variables at a time. The software also allows for a simultaneous two-way transfer of variable values between the main formula and secondary formulas and can perform calculations involving polynomial roots, derivatives, models, and iterative framing. Varicalc can plot high-resolution curves and work with a printer to produce hard-copy output. *(List Price: $148.50)*

Requires: Apple II Plus, IIe, or IIc

Practical Peripherals, Inc.
31245 La Baya Drive
Westlake Village, CA 91362
(818) 991-8200

CIRCLE READER SERVICE NO. **502**

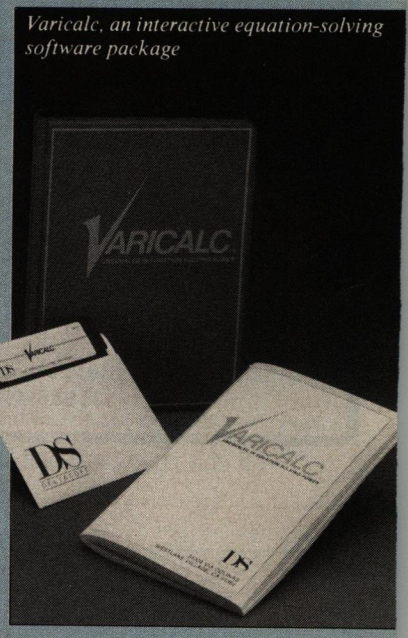
ROOMMATE STEREO SYSTEM

The Bose RoomMate stereo system plugs into the sound jack of a Macintosh or an Apple IIc and provides high-quality, room-filling sound. The RoomMate features two rugged 6 × 9 × 6-inch polypropylene loudspeaker cabinets, a built-in amplifier, an inboard transformer, and a mono-to-stereo adapter. Optional accessories include multipurpose mounting arms, wall brackets, and a travel bag. The RoomMate is available in black or ivory models. *(List Price: $199)*

Requires: Apple IIc or Macintosh

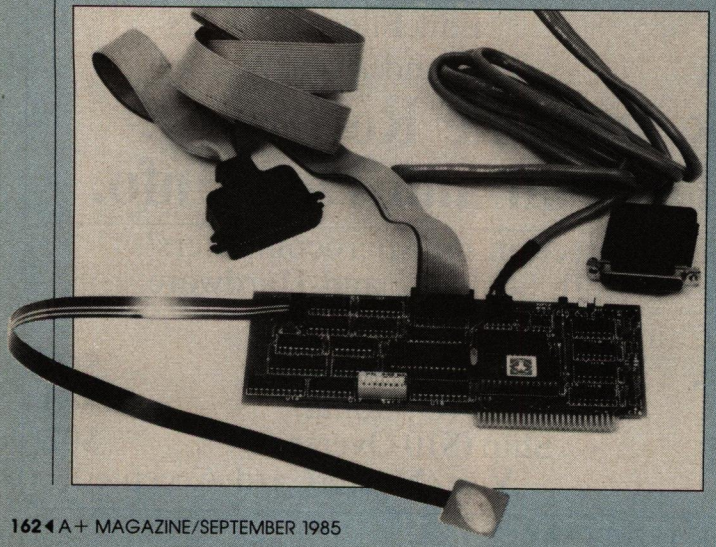
Bose Corporation
100 The Mountain Road
Framingham, MA 01701
(617) 879-7330

CIRCLE READER SERVICE NO. **503**



Varicalc, an interactive equation-solving software package

The FingerPrint Plus printer-interface card can work with a parallel- and a serial-interface printer simultaneously.



The Bose RoomMate stereo system

The X-10 Powerhouse interface comes with home-control software.

][SERIES ▸ X-10 POWERHOUSE INTERFACE

The X-10 Powerhouse enables your computer to control lights and electrical appliances in the home. This small peripheral comprises a self-contained microcomputer with its own microprocessor and a battery-backed memory that can sustain it without AC power for more than 100 hours.

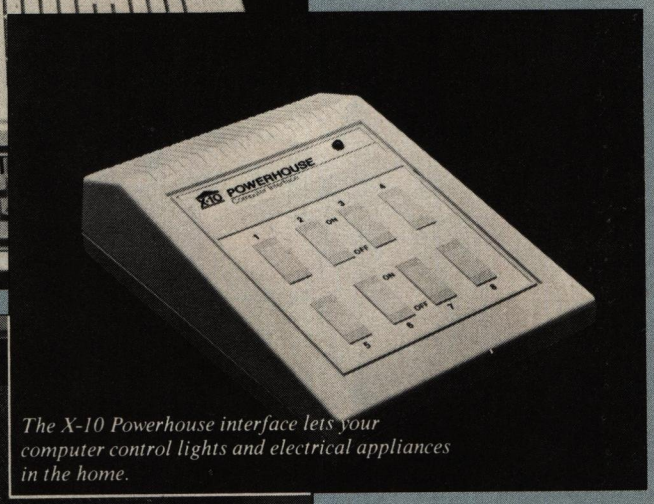
The X-10 Powerhouse sends signals over AC wiring to control up to 72 lights and appliances plugged into System X-10 modules that are plugged into 120-volt outlets throughout the house.

The interface comes with a complete home-control software package on disk. The software graphically steps you through each room in your home and prompts you to use a joystick to select the electrical device you wish to control. You can then operate the device instantly or program the times and days on which you want it to go on and off. A variety of plug-in X-10 modules and accessories are also available. *(List Price: $120)*

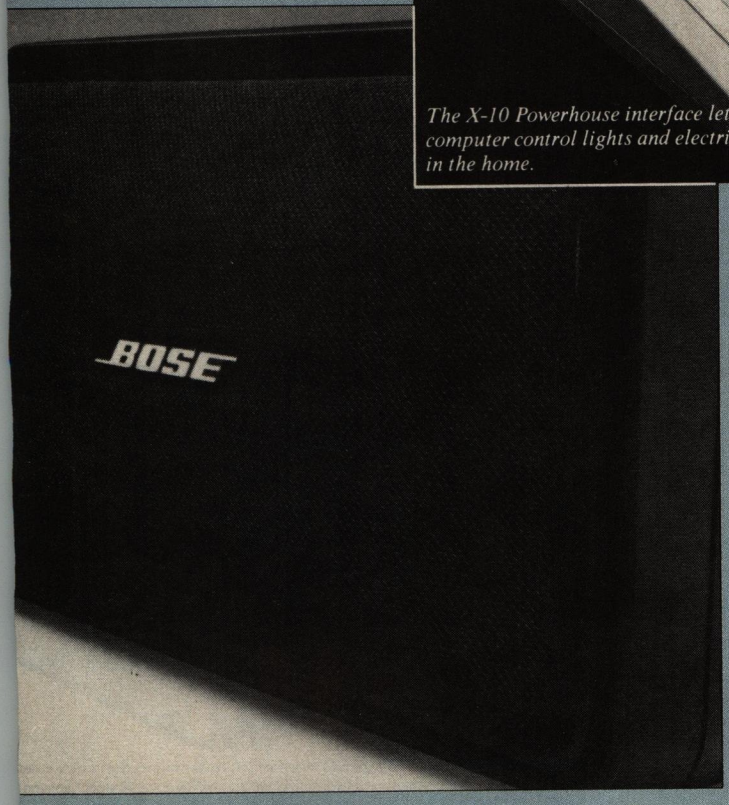
Requires: Apple IIe or IIc, joystick

X-10 (USA), Inc.
185A Legrand Avenue
Northvale, NJ 07647
(201) 784-9700

CIRCLE READER SERVICE NO. **504**



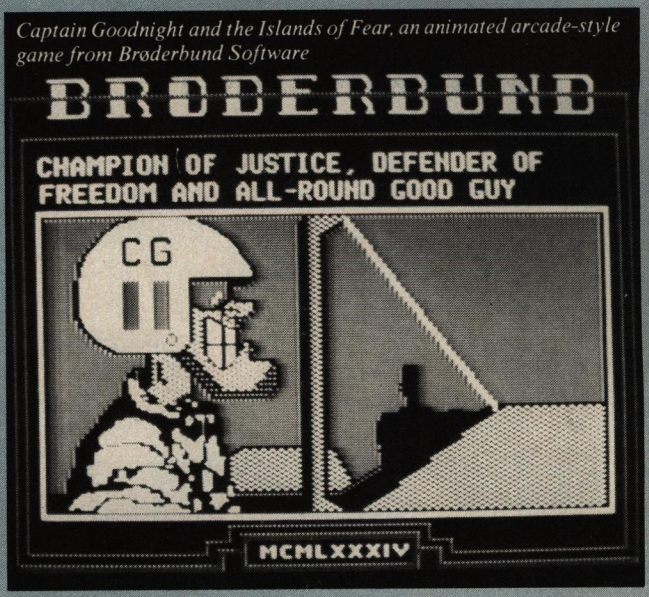
The X-10 Powerhouse interface lets your computer control lights and electrical appliances in the home.



][SERIES ▸ CAPTAIN GOODNIGHT AND THE ISLANDS OF FEAR

This new game from Brøderbund Software puts you in the driver's seat of

Captain Goodnight and the Islands of Fear, an animated arcade-style game from Brøderbund Software



Five new ways to

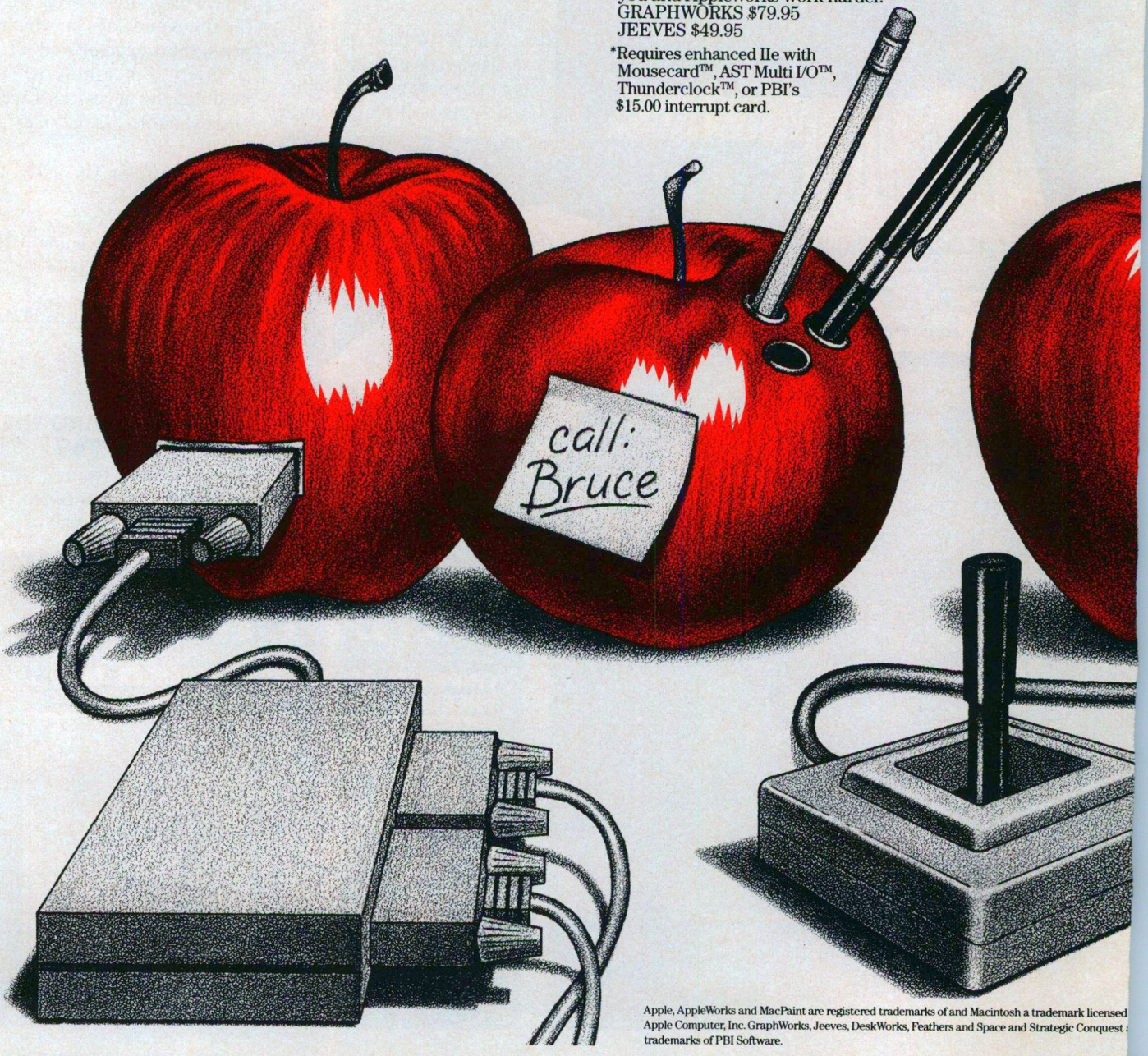
Provide a Mac with another outlet.

You have this problem. It's called more peripherals than ports. In light of this reality, you could reevaluate your expectations. Or get a Switch Box. You plug the Switch Box into a port. You plug two peripherals into the Switch Box. Then you can switch back and forth between them. In about the time it takes to change your mind.
SWITCH BOX $39.95

Give an Apple IIc or IIe* more to work with than AppleWorks.®

You and AppleWorks. You can process words, file data, crunch numbers. What more could you want? DeskWorks.™ A library of software programs that work with AppleWorks.™ GraphWorks™ converts your spreadsheet analyses into line graphs, bar graphs, stacked bar graphs or pie charts. Jeeves™ is a desktop organizer that gives you instant access to an appointment calendar, phonedialer with directory, 4-function calculator, memo pad and software alarm clock. And there are more DeskWorks programs on the way, all designed to let you and AppleWorks work harder.
GRAPHWORKS $79.95
JEEVES $49.95

*Requires enhanced IIe with Mousecard™, AST Multi I/O™, Thunderclock™, or PBI's $15.00 interrupt card.



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prepare an Apple®.

Introduce a Mac to some diversionary tactics.

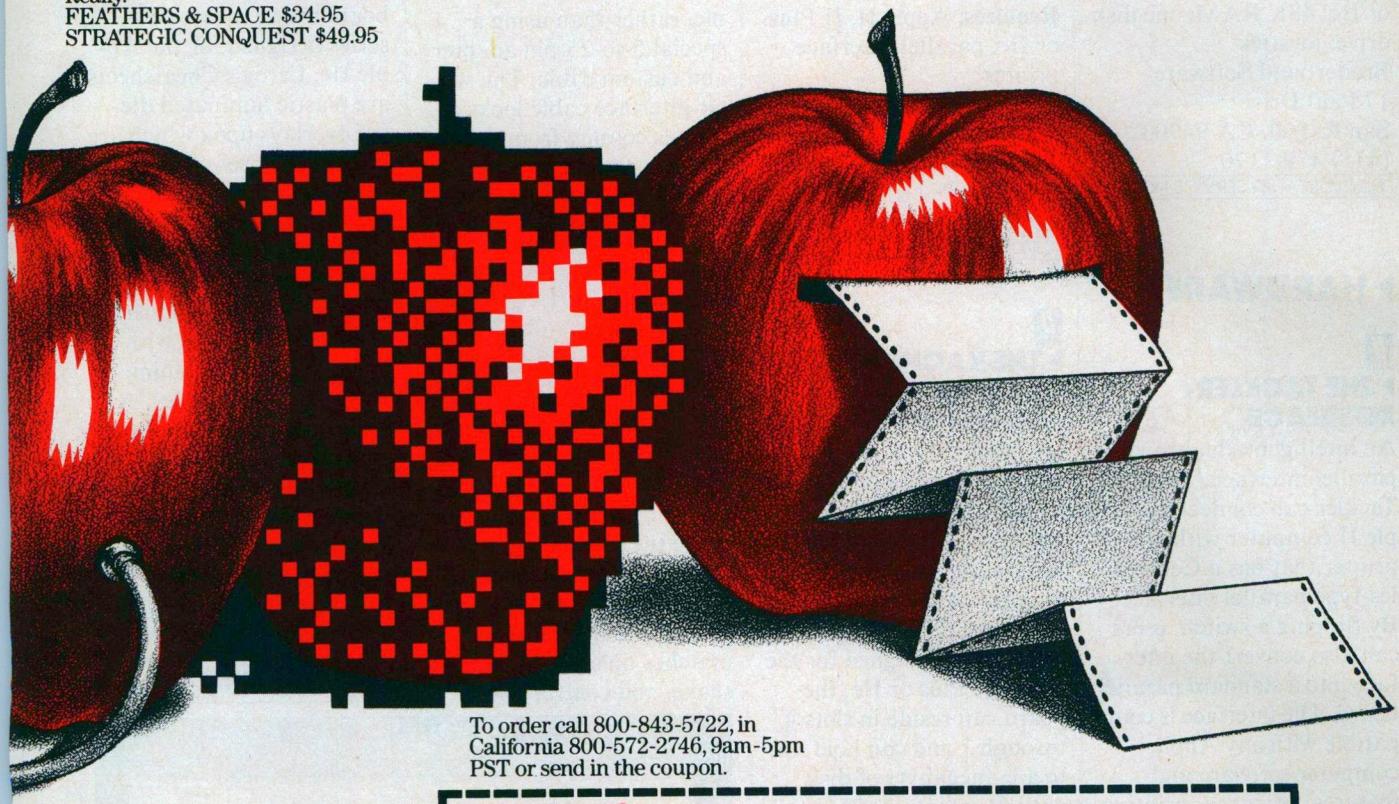
Say you and your Mac want to have a little harmless fun. In the office. Not as risky as it sounds when you're playing a game that lets you switch, instantly, from gamescreen to black. We have two of them. There's Feathers & Space,™ featuring giant avian attackers. It's kind of like *The Birds*. On another planet. And Strategic Conquest.™ Not a game you play for the first time in front of someone you want to impress. We're talking Armies, Navies and Air Forces. Complicated strategic maneuvers. Resource production and distribution decisions. We're talking a vast and dangerous alien world you will never know because its map has over 2 billion possible configurations. Really.
FEATHERS & SPACE $34.95
STRATEGIC CONQUEST $49.95

Grant a Mac some creative license.

We know some people who aren't content with ordinary icons. Sometimes they're called overachievers. And they achieve some interesting things with Icon Switcher. Original icons. From any MacPaint® picture. Of course, just as there are those who create icons, there are those who don't. So for those who don't those who do have created Icon Libraries. A Business Library. And a Fun & Games Library. Each with over 100 icons.
ICON SWITCHER $19.95
ICON LIBRARIES $19.95 each

Show a IIc how to reconcile differences.

You have an Apple IIc. You want a parallel printer. Or happen to have one. Are you happy? No. Because you can't plug a parallel printer into your IIc's serial ports. About this time you should be ready for some good news. Our serial box adapter is all your IIc needs to run a standard parallel printer. And print Epson graphics. It even has its own power supply (to prevent potential printer power supply problems). So you can have your Apple, and printer, too.
SERIAL BOX $69.95



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A SUBSIDIARY OF ITAT, INC.
1155B-H Chess Drive, Foster City, CA 94404

A-9/5

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CA residents add 6½% sales tax.

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☐Switch Box__@ $39.95
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☐Strategic Conquest__@ $49.95
☐Icon Switcher__@ $19.95
☐Icon Libraries __Business @ $19.95
__Fun & Games @ $19.95

IIc and IIe
☐GraphWorks__@ $79.95
☐Jeeves__@ $49.95

IIc
☐Serial Box__@ $69.95

Total amount enclosed $_____
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CIRCLE 242 ON READER SERVICE CARD

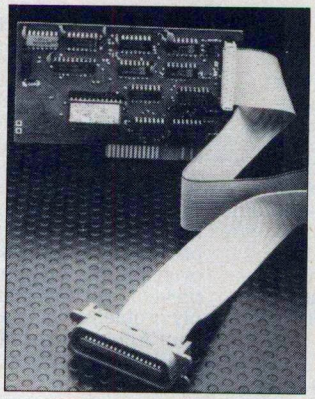
helicopters, airplanes, tanks, trucks, and submarines as you attempt to save the world from destruction. In this animated arcade-style game, you guide Captain Goodnight—a comic version of a movie superhero—on his mission to save the world from the evil Dr. Maybe's Doomsday Machine. The game includes the Secret Decoder, a device that you use to encode and decode secret messages. *(List Price: $34.95)*
Requires: Apple II Plus, IIe, or IIc; 48K RAM; one disk drive; joystick
Brøderbund Software
17 Paul Drive
San Rafael, CA 94903
(415) 479-1170
CIRCLE READER SERVICE NO. **505**

▸ HARDWARE

II SERIES

▸ THE TACKLER INTERFACE

An intelligent, dual-mode, parallel interface, The Tackler can connect an Apple II computer with any printer that has a Centronics-type parallel interface. By flipping a switch, users can also convert the interface into a standard parallel board. The interface is compatible with any Apple-computer software and features options for printing both text and graphics. Easy-to-use keyboard commands enable users to dictate margins, line widths, page lengths, automatic line feeds, text screen dumps, and printer bell control. For producing high-resolution graphics, a single-key command enables users to inverse, enlarge, and rotate images. *(List Price: $59.95)*



The Tackler, an intelligent, dual-mode, parallel interface for Apple II computers

Requires: Apple II, II Plus, or IIe; parallel-interface printer
Tymac Controls Corporation
127 Main Street
Franklin, NJ 07416
(201) 827-4050
CIRCLE READER SERVICE NO. **506**

II SERIES

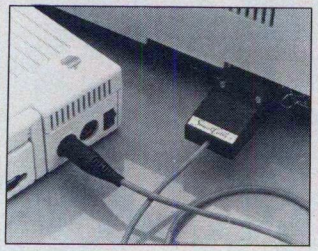
▸ THE KACHE BOARD

Ohio Kache Systems has released an SCSI hard-disk interface with cache host adapter nicknamed the "Kache Board." The 11 × 3¼-inch board features a high-speed buffer memory that stands between the CPU and a hard-disk drive. Designed for the Apple II Plus or IIe, the board can reside in slots 4 through 7 and can hold up to a ¼ megabyte of disk data. It maintains 256K of most-frequently accessed data in cache memory, resulting in fast data retrieval and efficient processing. Data fetching from disk is transparent so users need not copy files, and the system automatically updates data on the disk as users make changes. *(List Price: $695)*
Requires: Apple II Plus or IIe
Ohio Kache Systems Corporation
75 Tahlequah Trail
Springboro, OH 45066
(800) 338-0050
in OH (513) 746-9160
CIRCLE READER SERVICE NO. **507**

II SERIES

▸ SC809 SMART CABLE

IQ Technologies' Model SC809 Smart Cable enables users to connect the Apple IIc to a printer, plotter, or modem with one cable, rather than using a special 5-to-25-pin adapter and custom cable. The serial-interface cable looks at signals coming from the IIc and the peripheral and uses built-in "intelligence" to make the correct connections. To install it, users plug in the cable and set one switch; the SC809 then matches up all data, handshake, and control lines.



The SC807 Smart Cable from IQ Technologies, Inc.

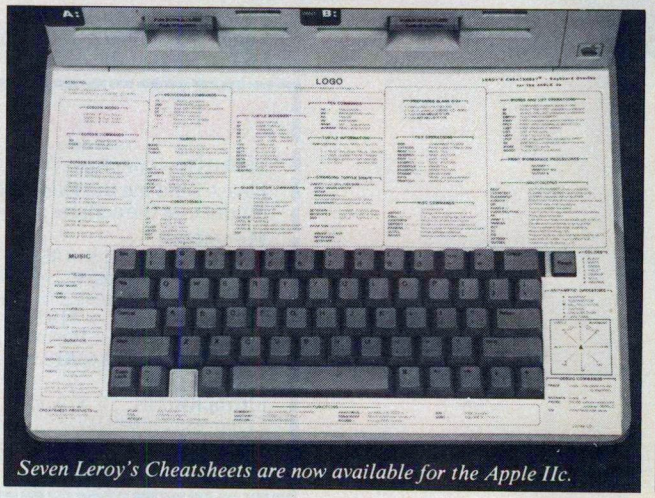
(List Price: $49.95)
Requires: Apple IIc
IQ Technologies, Inc.
11811 N.E. First Street
Bellevue, WA 98005
(206) 451-0232
CIRCLE READER SERVICE NO. **508**

▸ ACCESSORIES

II SERIES

▸ LEROY'S CHEATSHEETS

Cheatsheet Products has released the first seven keyboard overlays in a new series designed for the Apple IIe. Leroy's Cheatsheets are plastic laminated die-cut overlays upon which are printed the uses of all command keys for a particular product. Cheatsheets are now available for Flight Simulator II; Logo; Epson RX, FS 80, and 100 printers; the Grappler+ with Print Shop; and Gemini 10X and 15X printers. A set of three blank overlays that users can write for themselves is also available. *(List Price: $5.95 each)*
Requires: Apple IIe
Cheatsheet Products, Inc.
P.O. Box 111368
Pittsburgh, PA 15238
(412) 781-1551
CIRCLE READER SERVICE NO. **509**



Seven Leroy's Cheatsheets are now available for the Apple IIc.

▶ HARDWARE/ SOFTWARE

▶ DISAL-512 SIGNAL ANALYSIS

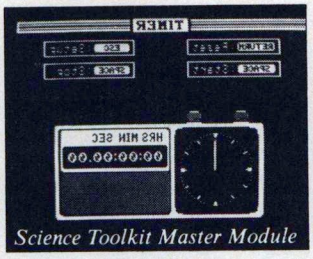
Designed for scientists and engineers, the DISAL-512 digital-signal-analysis system can display, transform, and manipulate any signal that is available in signal form or that can be digitized.

The plug-in board contains a 68000 CPU and 128K RAM. The software that drives the board is integrated in the DISAL (Digital Signal Analysis Language) supplied with the system. The software enables users to store a signal in one of 11 registers and operate upon it using more than 30 functions. The system automatically scales and displays the contents of the registers in high-resolution graphics, and various cursors give accurate measurements on such displays as cascade spectra and sonograms. DISAL disks are not copy-protected. *(List Price: $1450)*

Requires: Apple II Plus or IIe, DOS 3.3

Microsignal
P.O. Box 60312
Santa Barbara, CA 93160
(805) 964-2227

CIRCLE READER SERVICE NO. **510**



Science Toolkit Master Module

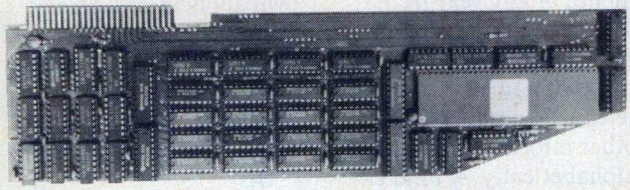
▶ SCIENCE TOOLKIT MASTER MODULE

Brøderbund Software's Science Toolkit Master Module includes both hardware and software that provides all the equipment you need to turn your computer into a science laboratory. The Master Module includes a temperature- and light-sensing probe and a special interface box that connects these probes safely and easily to the computer's joystick port. The software includes four on-screen lab instruments—a thermometer, a light meter, a timer, and a strip chart. The package includes a 128-page *User's Manual & Experiment Guide*. Future modules will include different software-based on-screen instruments. *(List Price: $59.95)*

Requires: Apple II Plus, IIe, or IIc; 64K RAM; one disk drive; joystick port

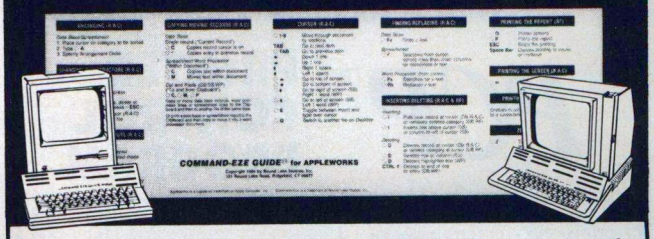
Brøderbund Software
17 Paul Drive
San Rafael, CA 94903
(415) 479-1170

CIRCLE READER SERVICE NO. **511**



The DISAL-512 board converts an Apple II into a digital-signal-analysis workstation.

Apple and Macintosh Owners... Triple the Usefulness of Your Software with COMMAND-EZE GUIDES. Just $12.95!



Now, eliminate the need to constantly look up software commands. Plus discover all those "special" commands buried in the manuals. ***COMMAND-EZE™ GUIDES*** save time—and increase the value of software. Get the guides used by businesses, schools, professionals!

- Puts all the software commands at your fingertips
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(203) 431-9696

kyan

PASCAL

For the Apple

kyan pascal is the most complete package available for learning and using the Pascal language. And now, it's available for the Apple II family of computers.

kyan pascal is easy to use, lightning fast, and loaded with features. It's a full Pascal implementation. It compiles and runs many times faster than other Pascal compilers.

kyan pascal features:

- Optimized Machine Code Compiler;
- Built-In Full Screen Text Editor;
- String-Handling, Chaining, Include File, and Other Powerful Extensions;
- Random Access Files and Full Graphics Support;
- Built-In Assembler (Allows Full Hardware Control);
- 13-Digit Arithmetic Precision; and,
- Tutorial Manual with Sample Programs.

kyan pascal requires 64K of memory and a single disk drive. No additional hardware is necessary. And, it comes with kyan's MONEY BACK GUARANTEE... **If not completely satisfied, return it within 15 days for a full refund.**

kyan pascal for the Apple **$69.95**
(Add $4.50/copy for handling. $12.00 outside North America. California residents add $4.55/copy for sales tax)

Send Check/Money Order to: ***kyan software,*** Dept K
Call: (415) 775-2923 1850 Union St., Ste. 183
MC/Visa Accepted San Francisco, CA 94123

CIRCLE 161 ON READER SERVICE CARD

Set Up Your *DOT MATRIX PRINTER* With a Touch of a KEY!

PCP™ PRINTER CONTROL PROGRAM

No longer do you have to enter long "set up strings" to take advantage of your DOT MATRIX PRINTER's capabilities. Just select from the MENU...let your computer do the rest! Condensed Characters, Double Strike Printing, Emphasized Characters, Special Line Spacing, and more! Comes complete with PROGRAM DISKETTE and OPERATING MANUAL. Includes information on how to program your printer in Basic, VisiCalc®, Applewriter. PCP is a very handy utility program you will use again and again!

VERSIONS:
Apple II, II+, IIe and III WITH
Apple DMP & Imagewriter
Epson MX*, RX & FX Printers
C.Itoh Prowriter I & II
NEC PC8023A
Okidata 82A, 83A, 92, 93 & 84
Gemini Star 10, 10X & 15

EPSON PRINTER CONTROL PROGRAM

PRINTER OPTIONS

A	CONDENSED	G	6 LINES/INCH
B	DOUBLE WIDTH	H	8 LINES/INCH
C	ITALICS	I	10 LINES/INCH
D	HALF SIZE	J	SPECIAL SPACING
E	EMPHASIZED	K	UNIDIRECTIONAL
F	DOUBLE STRIKE	L	BIDIRECTIONAL

SOME COMBINATIONS

M EMPHASIZED DOUBLESTRIKE
N DOUBLEWIDE EMPHASIZED
O DOUBLEWIDE EMPHASIZED DOUBLESTRIKE
P CONDENSED DOUBLEWIDE
Q CONDENSED DOUBLEWIDE DOUBLESTRIKE
R CONDENSED DOUBLESTRIKE
S CONDENSED HALF SIZE
T RETURN TO STANDARD SETTINGS

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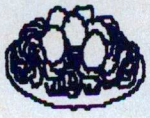

If so, you need "Amper Clamper". "Amper Clamper" is a collection of machine language utilities which you can use with your Applesoft BASIC programs to add missing instructions like SORT, ARRAY SEARCH, INPUT ANYTHING, FAST STRING READ and twenty more. Not only will your programs be easier to understand, but they'll also run faster. "Amper Clamper" comes on a non-protected disk and includes complete documentation. Order SP02 for only $2.50.

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A+ pipeline

▶ SOFTWARE

▶ VALIANT TURTLE ROBOT

Harvard Associates is now distributing the Valiant Turtle robot, developed by the English company Valiant Designs, in the United States.

The Valiant Turtle is a remote-controlled programmable robot that carries a pen with which it draws whatever is being drawn on a microcomputer's screen. An infrared transmitter sends signals that the Turtle's logic control converts into forward, backward, right, and left movement. The robot comes supplied with software that allows you to control it with popular versions of the Logo programming language. *(List Price: $399)*

Requires: Apple II
Harvard Associates, Inc.
260 Beacon Street
Somerville, MA 02143
(617) 492-0660

CIRCLE READER SERVICE NO. **512**

▶ DESKTOPPERS ACCESSORIES

Designed for the Macintosh, DeskToppers is a set of desk accessories that includes a Calendar, Little Black Book, Doodle Pad, and Music Maker. The Calendar provides users with a calendar containing any month of any year from 1904 to 2003. Little Black Book maintains up to 26 pages of names, addresses, telephone numbers, and other information, sorted alphabetically. A Find capability allows users to locate any information. Doodle Pad enables users to sketch a drawing and add it into a document or store it in the Scrapbook for later use. Finally, the Music Maker desk accessory lets users select a xylophone, clarinet, trumpet, or organ; use the mouse to play chosen notes; and then play back a tune. *(List Price: $49.95)*

Requires: Macintosh
Harvard Associates, Inc.
260 Beacon Street
Somerville, MA 02143
(617) 492-0660

CIRCLE READER SERVICE NO. **513**

▶ HACKER JACK SOFTWARE

Three programs are now available in Baudville's new Hacker Jack line of home and educational software. Video Vegas, designed for both beginners and professionals, features authentic casino action with the games of blackjack, draw poker, slots, and keno. In the program Ted Bear Discovers . . . Rainy Day Games, children can play the three classic card games of Concentration, Old Maid, and Go Fish with their playmate Ted Bear. Finally, Guitar Wizard enables both novice and experienced guitarists to learn and analyze scales, chords, and tunings for all types of fretted stringed instruments. Users can list all programs in the series and so customize them for their own applications. *(List Price: $29.95 each)*

Requires: Apple II, II Plus, IIe, or IIc; 64K RAM
Baudville
1001 Medical Park Drive SE
Grand Rapids, MI 49506
(616) 957-3036

CIRCLE READER SERVICE NO. **514**

▸ MOCKINGBOARD SYNTHESIZER SOFTWARE

Sweet Micro Systems' Mockingboard Division has introduced three new software enhancements for its Mockingboard line of music, sound, and speech synthesizers.

The Speech Development System lets you add or delete phonemes and manipulate the six variables—inflection, rate of speech, amplitude, filter frequency, rate of articulation transition, and rate of inflection transition—associated with each phoneme. You can thus customize speech and save it for use in your own programs.

The Foreign Language Rule Tables (FLRT) are a set of rules that, when used with the Text to Speech Algorithm, allow the computer to speak French, German, or British English. Users can use the tables alone or incorporate them into programs that teach foreign languages or are used for translation purposes. FLRT also works with the Speech Development System to generate foreign-language phrases for use in other software.

The third product, Developers' Toolkit, contains several useful utility programs that make the development of music-, sound-, and speech-enhanced software easier. The utilities include the Rule Editor; the Text to Speech Algorithm; AMPERMOCK, an ampersand utility for incorporating sound and speech in BASIC programs; Mconfig, which allows developers to reconfigure sound and sound/speech tools to run in any slot of the Apple II or IIe; Slotfinder, which locates the slot in which the Mockingboard resides; Dtect, which locates a Mockingboard D plugged into the Apple IIc's modem port; Cout, which intercepts all character output; and Input Intercept. *(List Price: Speech Development System, $39.95; FLRT, $24.95; Developers' Toolkit, $29.95)*

Requires: Apple II, II Plus, IIe, or IIc; Mockingboards A, B, C, or D

Sweet Micro Systems
50 Freeway Drive
Cranston, RI 02920
(401) 461-0530

CIRCLE READER SERVICE NO. **518**

▸ THE HOBBIT ADVENTURE GAME

Addison-Wesley has released The Hobbit, an adventure game based on J.R.R. Tolkien's book *The Hobbit* and developed by Melbourne House Software. In the game, you play the role of Bilbo the hobbit and roam through the world of Middle Earth. The program understands more than 400 words and can perform more than 50 different actions. Graphics screens illustrate 80 loca-

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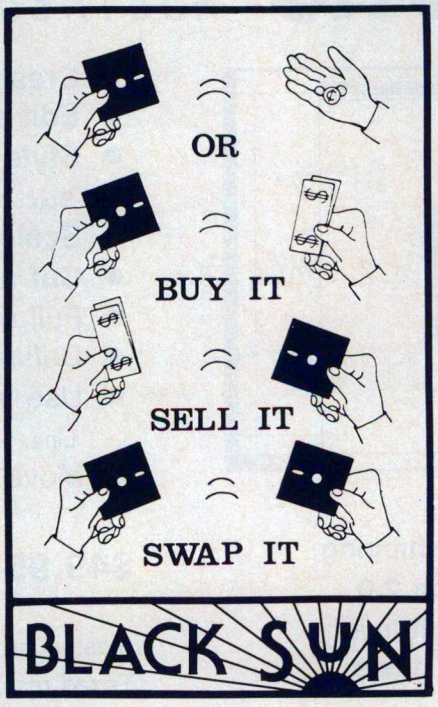

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tions within the story. The documentation provides two levels of clues, a paperback edition of *The Hobbit*, and a guide to Middle Earth. *(List Price: $34.95)*
Requires: Apple IIe or IIc, 64K RAM, one disk drive, monitor
Addison-Wesley General Publishing Group
Jacob Way
Reading, MA 01867
(800) 238-3801
in MA (617) 944-3700
CIRCLE READER SERVICE NO. **519**

IIGS SERIES

▶ P-TRAL TRANSLATOR

P-tral is an easy-to-use language translator that enables programmers to convert any Applesoft BASIC program to Apple Pascal. The disk-based software reads the BASIC source program and generates the equivalent Pascal text for input into the Pascal compiler. A file-transfer utility transfers the BASIC program to the Pascal disk, and P-tral checks the syntax of each BASIC statement. Users can correct errors using the Pascal editor or by returning to the BASIC program. P-tral then analyzes the structure of the BASIC program, helps the user to resolve variable-naming problems, displays the translated program, and writes it to disk. The package's utility programs also allow users to transfer data files for use with translated programs. *(List Price: $250)*
Requires: Apple II, II Plus, IIe, or IIc; 64K RAM; DOS 3.3/Pascal 1.1 or 1.2; 80-column display; two disk drives
Woodchuck Industries, Inc.
340 West 17th Street
Suite 2B
New York, NY 10011
(212) 924-0576
CIRCLE READER SERVICE NO. **520**

MAC

▶ HABA SYSTEMS' MAC SOFTWARE

Three new Macintosh software products are available from Haba Systems. HabaCom, a stand-alone communications package, lets users transmit and receive spreadsheet, database, and other MacWrite and MacPaint files, programs, or games. Users can also log on to as many as eight remote database services, such as The Source, CompuServe, or Dow Jones, and the package contains functions for communicating with remote computers using standard VT 100 and TTY protocols.

Haba Check Minder is an inexpensive, easy-to-use home-accounting program that displays and works with checks, deposits, drafts, checkbook registers, and so on. The program can maintain multiple accounts and display reminders when bills are due, automatically record payments and deposits, reconcile balances, and generate reports for tax-deductible expenses.

The third program,

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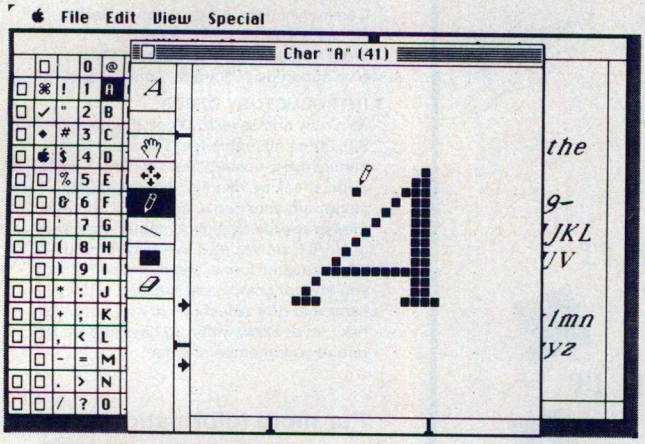

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Haba Window Dialer, is a versatile desk-accessory application that allows users to display a window containing about 250 names and 500 phone numbers without exiting from a program they are using. Once a user has located a desired name and number, the Window Dialer can dial the call either directly or using a long-distance discount service. *(List Price: HabaCom, Haba Check Minder, $69.95 each; Haba Window Dialer, $49.95)*

Requires: Macintosh, HabaDialer or modem (Window Dialer only)

Haba Systems, Inc.
15154 Stagg Street
Van Nuys, CA 91405-1025
(818) 989-5822

CIRCLE READER SERVICE NO. **521**

IIe SERIES

▸ COMPUTERS AND MUSIC SOFTWARE

Computers and Music, a store specializing in computer-music hardware and software, is now publishing its own line of software.

The Analyzer/Interpolator is a hardware/software system for the Apple IIe. The system can digitally record a sound, analyze its harmonic content, plot the sound amplitude envelope, and show sampled sound-wave cycles on the computer screen in an oscilloscope-like display. The system also enables users to create a wave from a sampled sound that will be compatible with Mountain Music, Passport Designs, and Syntauri computer music systems.

MIDI Madness enables users to play the Decillionix/Apple sampling board from any MIDI synthesizer. Users can assign up to eight different sampled sounds to any section of the MIDI keyboard and save the assignment to disk.

The MIDI Voice Librarian Series is software that offloads individual or banks of presets from a MIDI synthesizer into the computer's memory. Users can then name them, save them to disk, or send them back to the synthesizer using either a preset or a blank at a time. The software also allows users to reassign individual sounds from one bank to another.

Finally, the Apple IIe MIDI Development System contains one MIDI board and documented source code for both sending and receiving MIDI bytes. The system indicates appropriate addresses and includes a short program that can display MIDI bytes from any device that sends MIDI data. *(List Price: The Analyzer/Interpolator, MIDI Madness, $100 each; The MIDI Voice Librarian Series, $49.95 each; Apple IIe MIDI Development System, $125, [software only $25])*

Requires: Apple IIe

Computers and Music
1989 Junipero Serra Blvd.
Daly City, CA 94014
(415) 994-2909

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II SERIES

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Four Data Recorder packages are available: Data Reporter I contains a database; Data Reporter II has a database and a report generator; Data Reporter III contains a database, a report generator, a plotter/analyzer program, a graphs and statistics program, a modem package, and utilities; and Data Reporter IV has programs for personal research and statistics. *(List Price: I, $99; II, $179; III, $279; IV, $199)*

Requires: Apple II, II Plus, IIe, or IIc; 48K RAM; one disk drive

Softwest Programming
4418 E. Chapman
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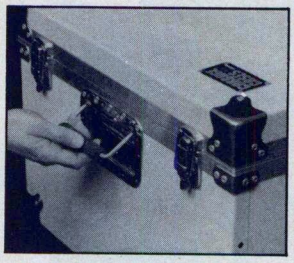

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II SERIES

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Requires: Apple IIe or IIc; Extended 80-Column Card for IIe; one floppy-, 3½-inch micro-, or hard-disk drive; mouse optional

Roger Wagner Publishing
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Suite E
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(619) 562-3221

CIRCLE READER SERVICE NO. **523**

A+ Macintosh DIRECTORY

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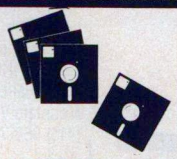

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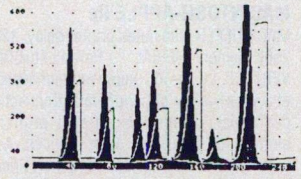

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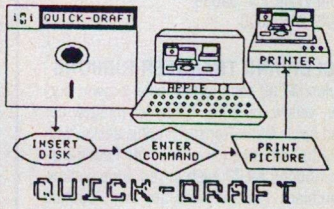

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CIRCLE 144 ON READER SERVICE CARD

RESCUE SQUAD
BY MICHAEL CALLERY
Questions from our readers

MONITOR INTERFERENCE

Q. *After purchasing an Apple IIc, I tried to back up the disks that are included with it. After many hours of frustration and failure, I moved the IIc away from the monitor and finally found success. Please tell your readers to experiment with the placement of the monitor and computer if they are having trouble with their disk drives.*

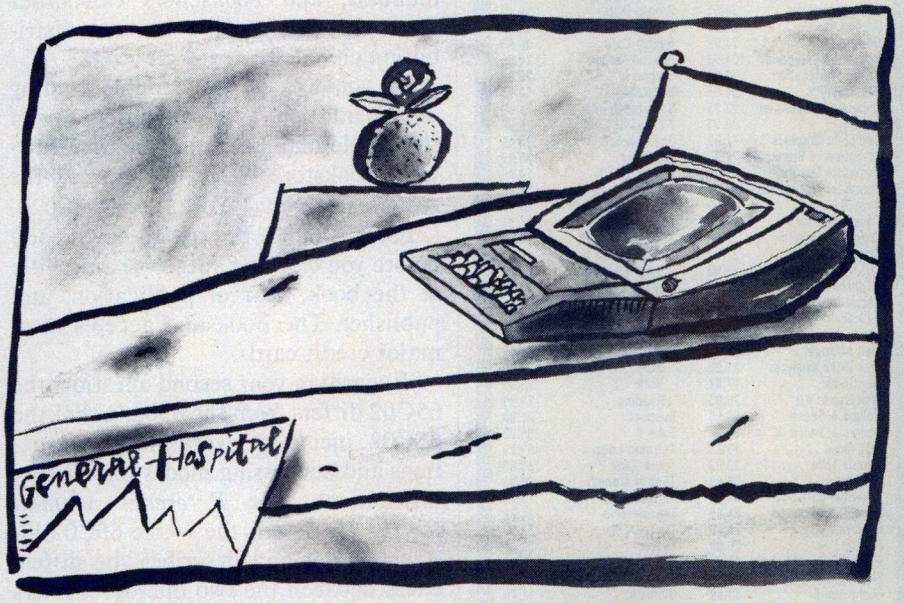
A. This problem exists for the Apple IIe computer also. CATs contain magnetic coils, and, without proper shielding, they radiate a lot of magnetism. Monitors placed directly on top of disk drives can cause everything from sporadic I/O errors to complete drive malfunction. If you are having disk-drive problems with either your Apple IIe or IIc, moving the monitor, computer, or disk drives may solve them.

Another problem with the Apple IIc is heat buildup. If the IIc is left on for long periods of time with the same disk in the internal drive, the disk becomes quite warm. As the disk warms, it expands and this expansion can cause data to be written to the wrong parts of the disk. If this problem sounds familiar, remove the disk from the internal drive when you are not using it.

THE APPLE IIc's 40/80 SWITCH

Q. *I have an Apple IIc and have had no success using the 40/80-column switch. I'm using a television with my IIc and cannot read 80-column text. How can I get it to work?*

A. You could be doing several things wrong. First, you must press the button down far enough so that it clicks into place and stays depressed (unless you have long fingernails, you'll have to use a toothpick or pencil). Second, you must reboot the computer after you press the button; pressing it while a program is running will have no effect. Last—and most important—few programs check the button. This button does not directly affect the display; it sets a flag in memory. Programs can look at the flag and determine whether users prefer a 40- or an 80-column display. Then the program can switch to the correct display with the appropriate commands. Programs written for all Apple II computers probably will not look to see if the button is depressed, but will display text in the generic 40-column mode or require you to install the program for specific 80-column circuitry. Newer programs that default to the Apple 80-Column Card or Extended 80-Column Card work well on an Apple IIc, but only in 80-column mode. If you are using software, such as AppleWorks, that requires an 80-column display, pressing the 40/80-column button won't help. You'll need a monochrome monitor or an RGB color interface and monitor.



LILLA ROGERS

TELEPRINTING

Q. *I use my Apple IIc to telecommunicate with The Source and Dialog using Access II software and an Apple modem. I would like to print directly to the printer rather than first saving a file to disk. Can I do this?*

A. Your problem is the software. Apple's Access II does not allow you to print while receiving, although such a function can be implemented with the Access programming language. You may want to consider another telecommunications program that does allow printing while receiving. (See *A+*, March 1985, pages 48–57.)

If you are communicating at 1200 bps, you may not be able to print while receiving. Printers are slow, and most of them cannot keep up with the steady stream of data that comes in over the modem. A print buffer will help, but you cannot be sure a particular hardware/software combination will do what you want it to do unless your dealer is willing to demonstrate it for you.

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CIRCLE 231 ON READER SERVICE CARD

▸ 65C02 DETAILS

Q. *I have an Apple IIc, and I need help. My dealer told me that much of the information in the* Reference Manual for the IIe *would apply to the IIc. After I spent $30 for the manual, I found too many differences. Where can I get the correct manual? Also, do you know of any books that give instruction on assembly-language programming of the 65C02 microprocessor?*

A. By the time you read this, the complete series of Apple IIe and IIc manuals should be available at many bookstores. (See "Picking Apple Manuals" in the February 1985 issue of *A+*.) Addison-Wesley, by agreement with Apple, is publishing most Apple manuals, and booksellers can order them through traditional book-distribution channels.

If you are having trouble finding documentation, you can order any of the Apple manuals from the McGraw-Hill Bookstore, 1221 Avenue of the Americas, New York, NY 10020, (212) 512-6230. Be sure to have ready before you call: the author's name, title of the book, year of publication, and publisher. The Bookstore accepts most major credit cards.

Regarding your second question, the 65C02 differs from the 6502 in that the 65C02 includes several new instructions and addressing modes for existing instructions. The *Reference Manual for the IIc* details the whole 65C02 instruction set and describes the differences between the two microprocessors and among the Apple 8-bit computers. This manual, in combination with a standard 6502 reference guide, should be adequate. (See "A Close Look at Recent IIe Enhancements," *A+*, August 1985, pages 45–54.) I imagine that the classic 6502 tutorial books will be revised to cover the 65C02.

You'll also need an assembler that can assemble the new instructions and addressing modes. Most of the popular assemblers have already been revised for the 65C02.

▸ IIc TO MAC TRANSFER

Q. *I have an Apple IIc and a Macintosh. Is there an easy way to transfer data between these computers?*

A. Yes. You've got at least these two options. If you have a modem attached to each microcomputer, and you have the appropriate communications software, you can upload text files from the first microcomputer to a large host computer—such as The Source, CompuServe, or Delphi—and then download

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CIRCLE 137 ON READER SERVICE CARD

them from the host to the second microcomputer. You'll have to pay connect time, file-storage charges on the information utility, and phone charges. Fortunately, a better way exists—you can make a direct connection through the computers' serial ports.

The IIc and the Mac each have two serial ports. Although the Mac's ports are technically more advanced than the IIc's RS-232 ports, you can directly connect the Mac and the IIc with the correct cable.

The cable is only half the solution though. You must also have compatible telecommunications programs running on both the Mac and the IIc.

For the IIc, I know ASCII Express works, although most other telecommunications programs should also work. For the Macintosh, simple programs such as Mock Terminal or Red Ryder work well; the former is a freeware desk accessory, and the latter is a public-domain terminal program. Both programs are available from many users-group libraries. Version 1 of MacTerminal may not work to your satisfaction because it fails to insert a line feed after each received carriage return, which causes lines to overprint. With the communications program in place on both computers, you're ready to send the file from the IIc to the Mac. It is usually easier to transfer only text files because you can edit text files in MacWrite or Microsoft Word. Although I haven't tried this type of transfer, DIF and SYLK files are merely structured text files and are accepted by Multiplan and other programs on the Macintosh. If you want to transfer Applesoft programs, you'll first have to save them to disk in a text file and then transfer the text files.

Readers with Apple II, II Plus, or IIe computers and an Imagewriter have it a bit easier. You need only connect the Mac Imagewriter cable to the Apple Super Serial Card instead of the printer and you're ready to go. Be sure to set the jumper block on the Super Serial Card to the modem position.

If you have another type of serial interface card in your Apple II computer, the Imagewriter cable may not work. Check the pin assignments; you may need a custom cable. Once the proper cable is connected, you have the same software requirements as owners of IIc computers. +

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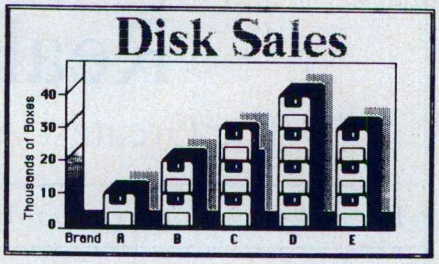

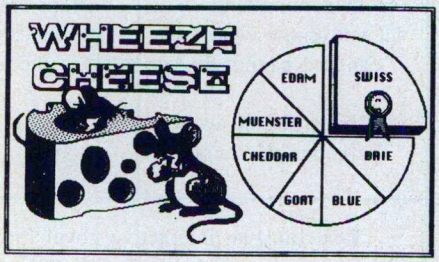

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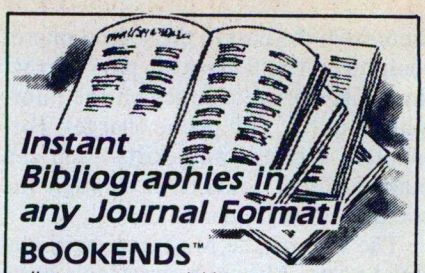

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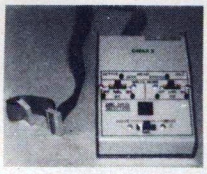

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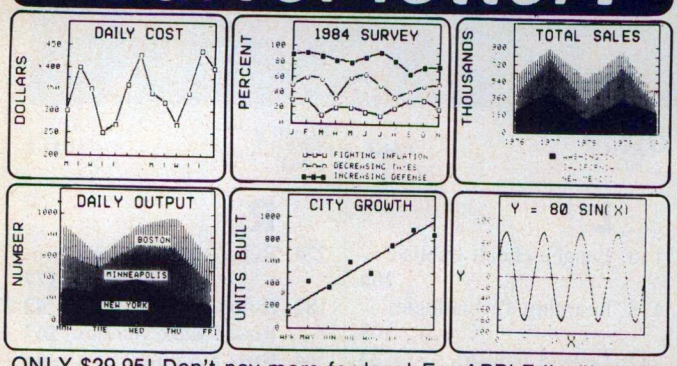

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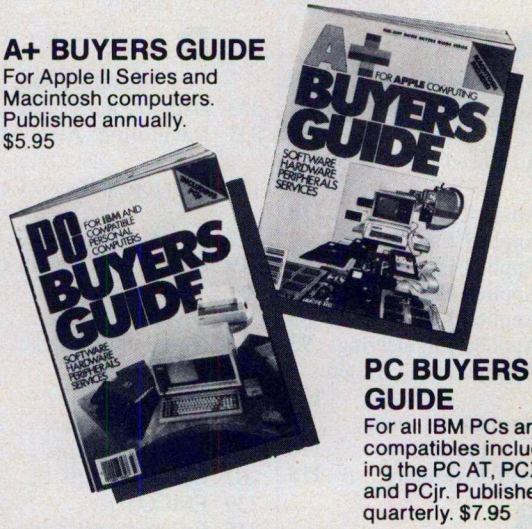

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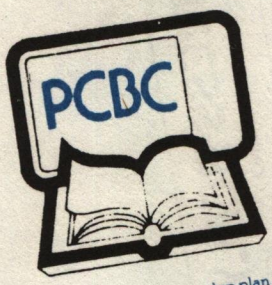

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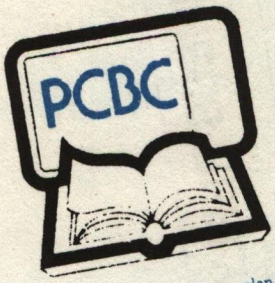

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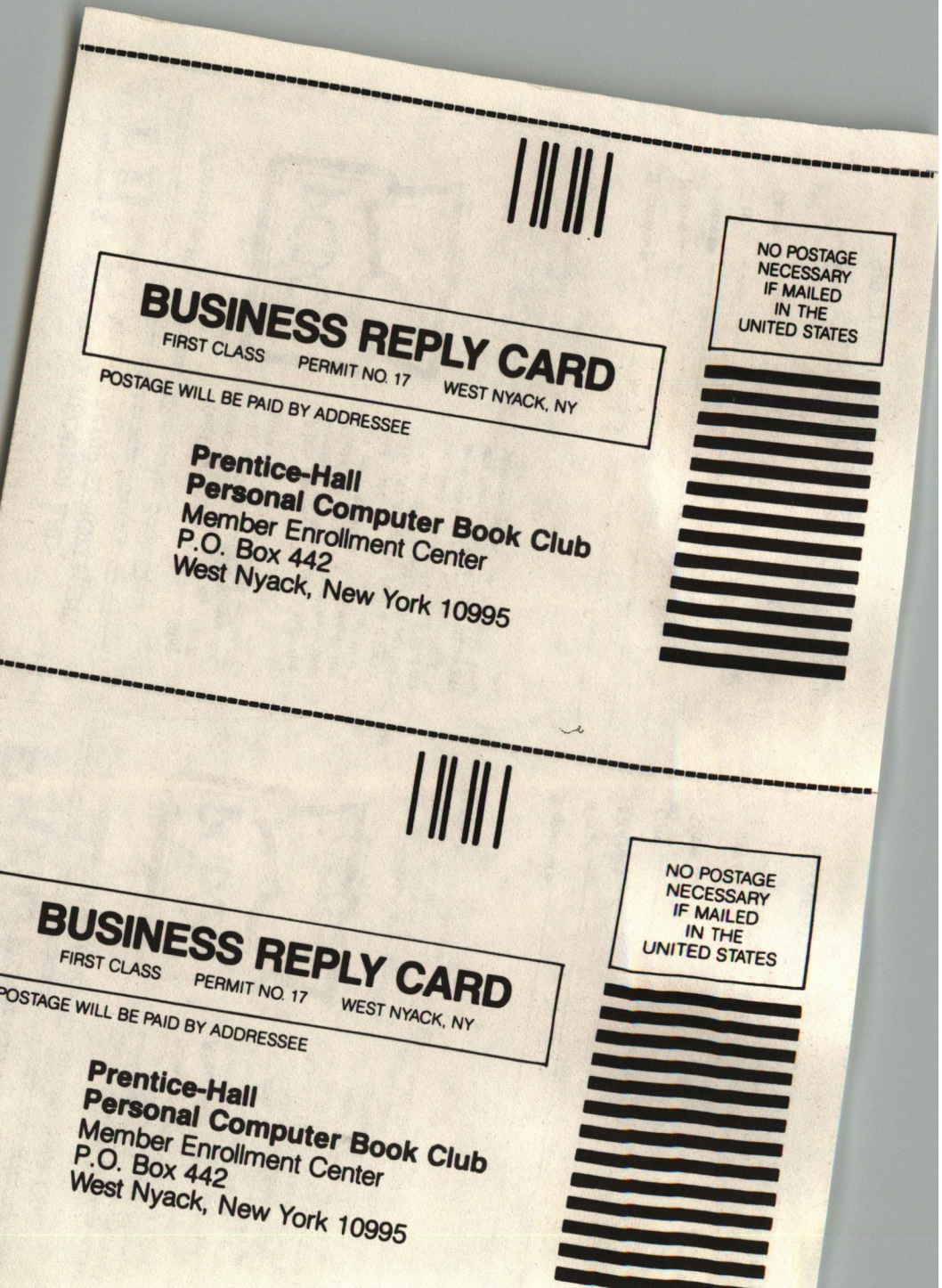

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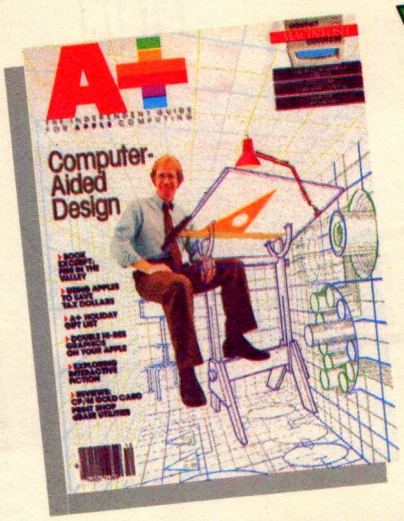

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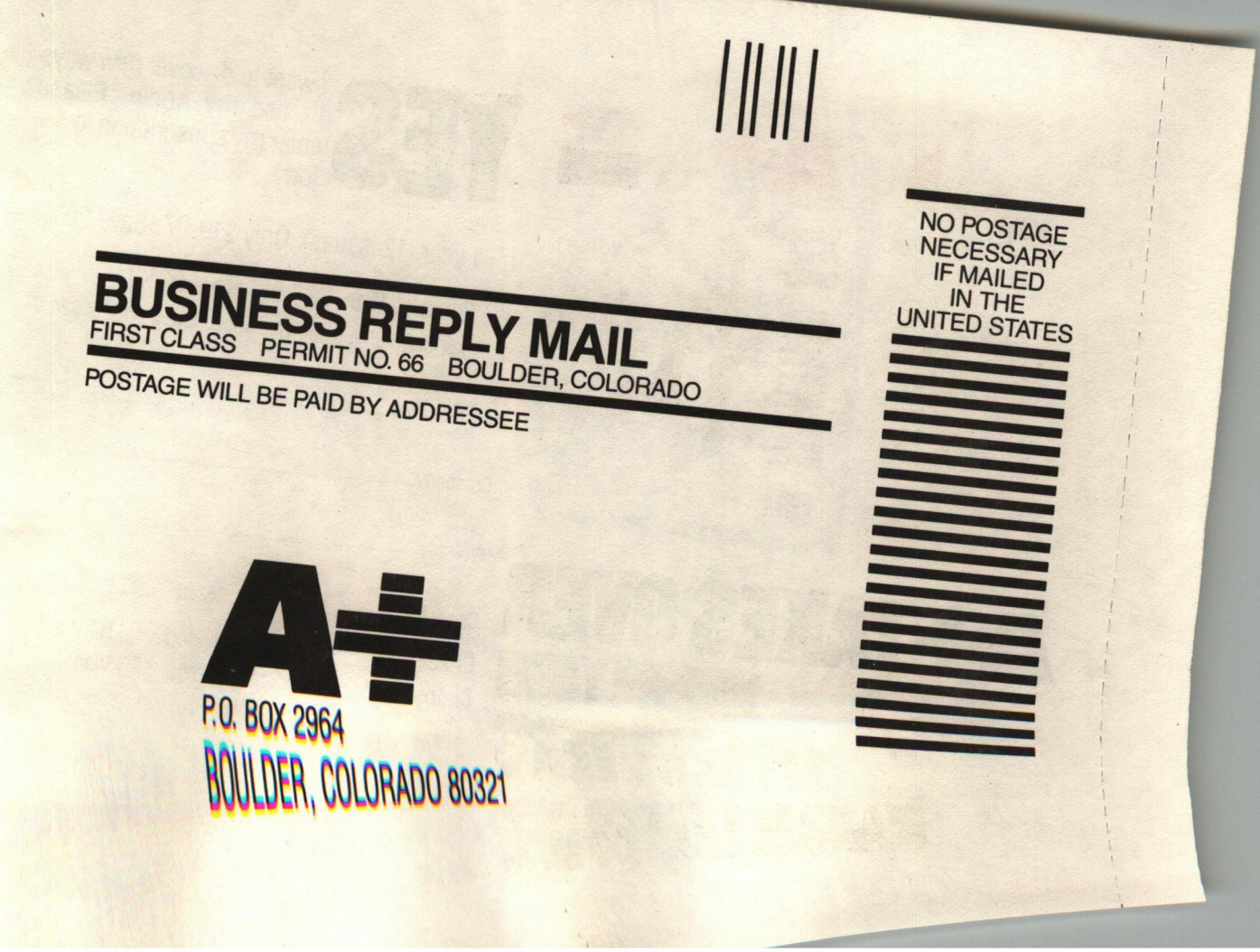

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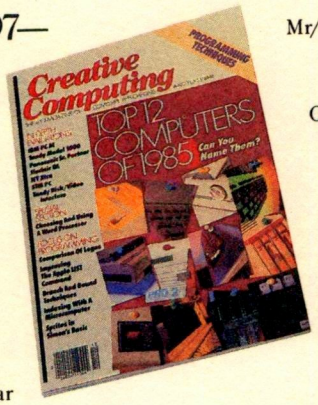

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